

RURAL
ARCHITECTURE.

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RURAL ARCHITECTURE:

A SERIES OF DESIGNS,

FOR

ORNAMENTAL COTTAGES AND VILLAS;

EXEMPLIFIED IN

PLANS, ELEVATIONS, SECTIONS, AND DETAILS.

WITH DESCRIPTIONS.

BY

JOHN WHITE,

ARCHITECT.



BLACKIE AND SON:

GLASGOW, EDINBURGH, LONDON, AND NEW YORK.

MDCCCLVI.

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W. G. BLACKIE AND CO., PRINTERS,
VILLAFIELD.

P R E F A C E.

ALTHOUGH many works have been published at various periods on Rural Architecture, and some of them possessing merit capable of affording a considerable degree of instruction, I have yet endeavoured to add my quota, and to do so in such a manner as to assist the amateur, as well as the professional draughtsman; convinced that works of this kind are often of great service to both the Architect and the Builder, in pointing out the proper methods in the execution of the various departments of work connected with the erection of Cottages and Villas. As it is not in accordance with my purpose to make a single remark either on the merits or defects of those designs, I, with all deference, submit the present Work to the public, confident that, owing to the great demand which exists for variety in the construction of Cottages and Villas, both in this and in other countries, there is ample room for another on the same subject.

I have endeavoured to make the present undertaking of such a nature as to render it both interesting and useful to all connected with Architecture, and of such a character as to accommodate the various ranks of society, the price being so moderate as to bring it within the reach of the humblest mechanic. The Designs are all original, and I flatter myself they will not be less worthy of notice on that account.

I have likewise introduced as great a variety as the limits of the Work will admit, both in the styles and size of the Designs, so that the erection of some of the Cottages and Villas will cost from *one hundred to ten thousand pounds*. Each Design is exemplified with Plans, Elevations, Sections, and Details of the principal parts, correctly drawn and explained, so that the generality of builders will find no difficulty in executing it. Being desirous to give as much information to the operative classes as practicable, I have endeavoured to show how each part may be executed to the best advantage, with regard to strength, neatness, and economy; and in order to make the Drawings as simple and comprehensive as possible, any part requiring Geometrical lines is fully illustrated. The Mouldings and Ornaments are drawn to a scale large enough to show every member in its exact proportions, so that any person possessing the slightest knowledge of Drawing may extend them to full size; and as I have introduced nothing but what will be practicable, it may be relied on that each will serve the purpose for which it is intended.

Having spared neither labour nor expense to render the Work acceptable to the public, and serviceable to those whose vocation requires a knowledge of Architectural Drawing, in order to proceed in their work with confidence, it is hoped that these Drawings, from the largeness of the scale, and the manner in which they are executed,

will prove very proper examples for copying, especially to young mechanics wishing to devote part of their time to the interesting and pleasing study of ARCHITECTURE; which, like many other inventions, had its rise from the dictates of "stern necessity," and has gradually advanced with society, so that we now behold it in its present state of perfection, adorning alike the palaces of the living, and the mausoleums of the dead.

In submitting these Designs, I feel confident that an enlightened public will estimate them by their inherent merits, and will not withhold their approbation and support if found worthy, and I therefore consider that it were unwise in me to bestow any recommendation; I trust, however, that many of the Drawings will be useful in instructing the ignorant, and assisting the intelligent, in the promotion of a science which has been ever conducive to the comforts and happiness of mankind.

JOHN WHITE.

NOTE TO THIS EDITION.

Regarding this edition of the Work, the Publishers deem it only needful to state, that the Plates containing the Designs for one very large and costly Mansion have been withdrawn, and Plans, by several architects, of Cottages and Villas actually erected at a moderate cost, have been substituted, and the Descriptions of the whole revised, and printed in an improved form.

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RURAL ARCHITECTURE.

DESCRIPTION OF THE PLATES.

DESIGNS FOR A VILLA IN THE GOTHIC STYLE.

PLATES I.—VII.

THIS Villa may be considered suitable for a gentleman of moderate fortune, either as a summer residence, or as the mansion-house, on a small estate. If placed in a romantic situation, so as to harmonize with the style of building, it is calculated to have a very pleasing effect.

PLATE I.—PLAN OF SUNK FLOOR AND FRONT ELEVATION.

PLAN OF SUNK FLOOR.—The space A represents the *Servants' Bed-room*, 20 feet by 12 feet; height of ceiling 8 feet 6 inches, lighted from the sunk area by a window in two compartments, each 2 feet 6 inches by 5 feet 6 inches in the clear; the stone mullion in the centre to be 12 inches in breadth. The dotted lines show where two beds may be placed, so as to prevent the break in the ceiling being observed, which requires to be lower in this part of the room, to admit of pavement in the passage above; this may be done by a beam, 13 inches deep by 8 inches thick, cut down the centre, and the ends reversed and trussed with iron; this beam to be placed below the partition wall of the passage above, and 4 inches lower than the upper side of the principal joists; the short scantlings, resting upon the beam, to be kept at a proper height, in order to make the pavement in the passage and the other floors on the same level.

B, *Laundry*, 19 feet 9 inches by 11 feet 9 inches, with an octagonal recess on one side 9 feet by 3 feet 6 inches, and 8 feet 6 inches high, lighted also from the sunk area, by a window of the same dimensions as the former. The flue for this room to be carried over the passage with an arch into the thick wall.

C, *Beer-Cellar*, 13 feet by 12 feet 6 inches, covered by two brick arches, supported on a cast-iron beam, shown on the Plan by dotted lines; the form and height of the arches are shown in the Section, PLATE IV.

D and E, *Wine and Spirit Cellars*, each 18 feet by 11 feet 3 inches, arched with brick in the same manner as the Beer-Cellar. The stair leading down from the principal floor to have seventeen steps, length of tread 3 feet 9 inches, breadth 9 inches, rise $6\frac{3}{4}$ inches, to be shut in at the bottom by a folding door, 7 feet by 3 feet 9 inches. *Passage*, 31 feet long by 4 feet 3 inches wide, lighted by a fan-light above the door, 3 feet 10 inches by 1 foot 2 inches.

F, F, *Cellars* below the ground; the one meant for coal is 14 feet by 8 feet, arched with brick, with an opening in the arch to admit the coals from the top. The others, for ashpit, &c., 8 feet by 7 feet, arched in like manner, and properly secured from surface water by mastic between the arch and the pavement or roadway.

G, *Sunk Area*, 31 feet 6 inches by 7 feet, surrounded by an iron railing, as shown in the Elevation, and paved in such a manner as to give a sufficient declivity for carrying the water into the drains; the arrangement of which depends wholly on the situation of the ground; the stair leading down to the area has fourteen steps, length of tread 4 feet, breadth $9\frac{3}{4}$ inches, rise $6\frac{3}{4}$ inches. The spaces shown on the Plan without doors, will not require any further excavation than is necessary to obtain a good foundation.

FRONT ELEVATION.—This is 56 feet long, exclusive of the oriel window, which extends 3 feet, and the back part of the building 7 feet 3 inches farther. The height from the ground to the top of the side wall is 27 feet 3 inches, to the gable top 40 feet 3 inches, and from the ground to the top of the chimney-stalks 47 feet 3 inches.

The entrance within the *Porch* is 4 feet 6 inches wide, and 9 feet 6 inches high, to the top of the soffit of the arch, and raised 1 foot 6 inches above the level of the ground, ascended by three steps, tread 1 foot, rise 6 inches. The window on each side of the entrance door is 1 foot 2 inches wide, by 6 feet 6 inches high, to the top of the soffit of the arch. The height of the porch, from the ground to the top of the enriched battlement, is 17 feet 9 inches, and from the ground to the top of the octagonal buttresses, 21 feet 6 inches; its breadth, including the octagonal buttresses, is 14 feet 6 inches; the width of the entrance, in two sides of the porch, is 6 feet 6 inches, and the height, from the top of the steps to the top of the soffit of the arch, 9 feet 6 inches.

The *Oriel Window* is the same height to the top of the battlements as the porch; the central part of it is divided into two compartments, each 2 feet 4 inches wide by 10 feet to the top of the soffit of the arch; the diagonal openings are each 1 foot 4 inches by 10 feet in the clear. The other windows on the ground floor are divided into two compartments, each 2 feet 3 inches by 9 feet to the top of the soffit of the arch; each window is crowned with a dripstone moulding, which extends 1 foot 8 inches below the top of the window. The form of the mullions and tracery of the windows will be best understood by referring to the details of oriel window, PLATE VI.

The entrance to the *Scullery* is 3 feet 9 inches wide; the height, from the top of the steps to the top of the fan-light, is 10 feet 4 inches, deducting 2 feet 4 inches for fan-light and transom, making the door 8 feet high, ascended by four steps, tread 10 inches, rise $6\frac{1}{2}$ inches.

The chamber floor windows are 17 feet 3 inches from the ground, their height is 7 feet 4 inches, divided into two compartments, each 2 feet wide; the one above the oriel window is

crowned with a tablet, which reaches 1 foot 4 inches below the top of the window. The cornices, pendants, tracery skews, balls, and points, are detailed in PLATE V.

PLATE II.—PLAN OF GROUND FLOOR AND FLANK ELEVATION.

PLAN OF GROUND FLOOR.—The space A represents the *Drawing-room*, 24 feet by 18 feet 6 inches, exclusive of the bay, 11 feet 6 inches by 3 feet 9 inches; height of ceiling, 13 feet 3 inches.

B, *Dining-room*, 27 feet 9 inches by 18 feet 3 inches; height 13 feet 3 inches.

C, *Parlour* or *Library*, 20 feet by 17 feet, exclusive of the bay, 9 feet 10 inches by 3 feet 6 inches; height 13 feet 3 inches.

D, *Entrance-hall*, 10 feet square, lighted by two small windows, or side lights, and an arched entrance to the staircase, 5 feet wide, and 10 feet 9 inches high, from the floor to the top of the soffit of the arch. The form and height of the groined ceiling in the porch and entrance-hall are shown on the Section, PLATE IV.

E, *Waiting-room*, 15 feet by 12 feet—the waiting-room to have an entresole placed over it, to serve as a store-room—the entrance is by a door on the second landing of the stair; the height of the waiting-room to be 6 feet 9 inches, the joists and floor 9 inches, and the store-room 6 feet, which will require the joists to be 3 inches narrower above the entresole, in order to make the chamber floor level. The depth of the joists is shown on the Section, PLATE IV.

F, *Kitchen*, 18 feet 9 inches by 16 feet; height of ceiling, 11 feet 9 inches.

G, *Scullery*, 11 feet by 8 feet 6 inches; height 11 feet 9 inches.

H, *Plate Pantry*, 11 feet by 9 feet 9 inches; height 11 feet 9 inches. The passage from the staircase to the kitchen door is 18 feet long by 4 feet 8 inches wide, and 13 feet 3 inches high. This passage, kitchen, scullery, plate pantry, staircase, entrance-hall, and porch, should be paved with stone. The staircase is 17 feet 9 inches by 14 feet 6 inches, lighted from the roof by a horizontal skylight, with obscured or stained glass, placed in the ceiling below the skylight shown on the plan of roof, PLATE IV. The stair is divided into three flights of 9 steps each, with square landings, length of tread 4 feet 2 inches, breadth $10\frac{3}{8}$ inches, rise $6\frac{1}{4}$ inches; the height and form of the ceiling are also shown on Section, PLATE IV.

I, *Sunk Area*, already described.

K, *Porch*, 10 feet 9 inches by 9 feet 6 inches, ascended by two steps, length of tread 6 feet 3 inches, breadth 1 foot, rise 6 inches.

THE FLANK ELEVATION is 57 feet 9 inches long, exclusive of the wing behind the porch, which extends 9 feet 6 inches; the height of this wing is 27 feet 3 inches from the ground to the top of the side wall, and to the gable top 40 feet 3 inches; and from the ground to the top of the chimney-stalks, 47 feet 3 inches; from the ground to the top of the side wall of the lower part of the Elevation, 22 feet 9 inches; and to the ridge, 31 feet 6 inches, and from the ground to the top of the chimney-stalks, 38 feet 6 inches.

The breadth of the porch is 13 feet 6 inches, over the octagonal buttresses, and its height the same as in Front Elevation.

The height of the oriel window, from the ground to the top of the battlements, is 17 feet 9 inches; the central part is divided into three compartments, each 2 feet wide by 10 feet high,

to the top of the soffit of the arch; the diagonal openings are each 1 foot 4 inches by 10 feet; the other two windows on the ground floor are divided into four compartments, having a mullion in the centre, with a transom $5\frac{1}{2}$ inches broad; the height, from the sill to the under side of the transom, is 5 feet 8 inches; and from the upper side of the transom to the top of the window, 2 feet $10\frac{1}{2}$ inches by 2 feet 3 inches, crowned with a tablet which reaches 1 foot 8 inches below the top of the window.

The chamber floor windows are 17 feet 3 inches from the ground; the one over the porch is 7 feet 4 inches high by 2 feet wide; the two over the oriel window are divided into two compartments, each 2 feet wide by 7 feet 4 inches high, crowned with tablets which reach 1 foot 4 inches below the top of the window. The two chamber windows in the lower part of the elevation are divided into two compartments, each 2 feet wide by 6 feet high.

The arrowlets in the gable may be filled with luffer boards for ventilating the roof.

PLATE III.—PLAN OF CHAMBER FLOOR AND BACK ELEVATION.

PLAN OF CHAMBER FLOOR.—The space A represents a *Bed-room*, 18 feet 6 inches by 13 feet 9 inches; height of ceiling 11 feet.

B, *Dressing-room* to ditto, 14 feet by 10 feet, height 11 feet.

C, *Bed-room*, 17 feet by 14 feet, height 11 feet.

D, *Bed-room*, 15 feet by 12 feet, and 11 feet high.

E, *Bed-room*, 18 feet 3 inches by 15 feet 3 inches, having a pendentive ceiling, as shown in the Section, PLATE IV. The flat part of the ceiling is 9 feet 10 inches high, and 8 feet from the floor to the spring of the coved spandrels.

F, *Bed-room*, 13 feet 3 inches by 12 feet; the ceiling of this room to be of the same height and construction as the former.

G, *Bed-room*, 18 feet 9 inches by 13 feet 6 inches.

H, *Nursery*, 18 feet 9 inches by 13 feet 6 inches. The floor of this room and the bed-room G, being 1 foot 6 inches below the level of the other floors, will require 3 steps down from the passage, as shown in the Plan; these rooms to have coved ceilings, 8 feet 9 inches high in the centre. The small bed-room D having an entrance from C, and the bed-room F an entrance from E, they may be used either as dressing-rooms or bed-rooms, as required.

K, Housemaid's *Pantry*.

L, *Water-closet*, 5 feet 6 inches by 4 feet 9 inches, height 11 feet; the cistern to be placed above the seat, and finished below with elliptical soffit, as shown in the section, PLATE IV.

M, *Bath-room*, 12 feet 6 inches by 5 feet 6 inches, height 11 feet.

N, *Stair-closet*, 4 feet by 3 feet 9 inches. The form and size of the passages will be best understood by referring to the Plan. The dimensions of the various rooms on this and the other floors are measured from the rough walls.

THE BACK ELEVATION is 63 feet long, exclusive of the oriel window, which extends 3 feet. The height from the ground to the top of the side walls of the lower part of this Elevation is 19 feet 6 inches, and to the top of the roof 29 feet, and from the ground to

the top of the chimney-stalks 35 feet. The height of the other parts of this Elevation will be found by referring to the description of Flank Elevation, PLATE II.

Windows.—The blind window on the ground floor is divided into two compartments by a transom, $5\frac{1}{2}$ inches broad; the height from the sill to the under side of the transom is 5 feet 8 inches, and from the upper side of the transom to the top of the window 2 feet $10\frac{1}{2}$ inches by 2 feet 3 inches, crowned with a dripstone moulding, which reaches 1 foot 8 inches below the top of the window. The blind window on the chamber floor is 7 feet 4 inches high by 2 feet wide. The windows in the gable end are the same as those described in PLATE II. The window, divided into three compartments, on the ground floor of the lower part of the Elevation, is 7 feet 9 inches high, and each compartment 1 foot 10 inches wide. The other window, in two compartments, is 7 feet 9 inches high by 1 foot 10 inches wide. The chamber floor windows in this part of the house are 16 feet from the ground, divided into two compartments, each 1 foot 9 inches wide by 5 feet 6 inches high. The small window in the gable, for lighting the roof, is 3 feet high by 2 feet 3 inches wide. The skylight over the staircase is divided into three compartments, each 2 feet 6 inches wide by 6 feet 6 inches high.

PLATE IV.—SECTION AND PLAN OF ROOF.

SECTION.—In order to make the *Section* easily understood, I shall point out in what direction the *Section* line passes through the various apartments on each floor

On the Sunk floor, PLATE I., the *Section* runs on a straight line through the centre of the porch to the other side of the building. The space below the porch is not intended to be excavated any farther than a good foundation may be obtained; and, of course, the depth of the foundation walls depends wholly on the nature of the ground. The *Section*, after passing through the front wall, cuts a small cellar, arched with brick, 8 feet high from the floor to the centre of the arch, and fitted up with stone shelves for bottles, &c. Passing through the cellar door, which is 7 feet high, it cuts the passage, showing the brick arch, 8 feet 3 inches high at the centre, and 7 feet 9 inches at the spring. The area door and part of the fan-light are seen on the end of the passage.

On the *Section* of the beer-cellar C is shown the form of two brick arches, which are supported by a cast-iron beam, 12 inches deep by $1\frac{3}{4}$ inches thick, with a flange on the under side, 5 inches broad by $1\frac{1}{4}$ inch thick. The height from the floor to the under side of the beam is 7 feet 5 inches, and to the centre of the arch 8 feet 3 inches. The beer-cellar passage, and small cellar to be paved with stone.

The space below the dining-room B, PLATE II., is cleared out, only so as a proper ventilation may be had under the floor; this may be obtained by having small openings through the walls secured by iron gratings. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart, supported on dwarf walls.

The Section on ground floor, PLATE II., is cut through the centre of the porch K, and entrance-hall D, running on a straight line through the staircase, until it enters the dining-room B, where the line breaks off to the centre of the room, passing through the window, showing the mullion coloured black.

The entrance to the porch is 10 feet 6 inches high from the floor to the top of the soffit of the arch; and the groined ceiling is 12 feet 6 inches high from the floor to the centre of the arch, and 9 feet 6 inches at the spring. The groined ceiling in the entrance-hall D is 13 feet 3 inches high at the centre, and 9 feet 6 inches to the spring. The Gothic doors are 9 feet 4 inches high to the top of the arch, by 3 feet 10 inches wide, crowned with ogee canopies; this door is intended to open in two halves, to fall back into the doorway, and to have a square door into the room, 8 feet high by 3 feet 10 inches wide.

The Staircase is 13 feet 5 inches high, from the floor to the ceiling of the landing.

The doors in the dining-room B are 8 feet high by 3 feet 10 inches wide, finished with architraves and cornices, as shown in detail, PLATE VII. The base and surbase are also detailed on PLATE VII. The chimney-piece is 4 feet wide by 3 feet 3 inches in the clear.

The joists above the dining-room are 12 inches deep by $2\frac{1}{2}$ thick, and in the stair-landing, entrance-hall, and porch, they are 10 inches deep by $2\frac{1}{2}$ thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The Section on the chamber floor, PLATE III., passes over the porch, showing part of the Flank Elevation, PLATE II., cutting through the water-closet L, passage, staircase, and passage, until it enters the bed-room E, where it breaks off to the centre of the room, cutting the window in the same manner as on the ground floor.

The Section of the water-closet shows the seat, 1 foot 8 inches high, with skirting above the seat, 12 inches broad; also the form of the arch supporting the cistern, and a small door, 1 foot 10 inches high by 2 feet wide, giving access to the cistern.

The Section through the passage shows part of the door of the bed-room C, 7 feet 3 inches high by 3 feet 3 inches wide. The doors on the stair-landing are of the same dimensions.

The height of the coved ceiling in the staircase, from the stair-landing to the upper side of the impost cornice, is 21 feet, to the top of the cove 13 feet 4 inches, and to the under side of the horizontal skylight 14 feet 6 inches.

The passage leading to the bed-room E, to have a coved ceiling, 9 feet 10 inches high at the centre, and 9 feet 2 inches at the spring. The passage leading to the nursery and bed-rooms D and G, branches off this passage through an archway, 8 feet 6 inches high (from the floor to the top of the soffit of the arch) by 4 feet wide. The window on the end of this passage is 6 feet 3 inches high, by 3 feet 3 inches wide.

The doors in bed-room E are 7 feet 3 inches high; the press door 3 feet, and the room door, 3 feet 3 inches wide. The chimney-piece is 3 feet wide, and 3 feet high in the clear.

The Section of the roof over the staircase shows the manner in which the couples are framed, so as to admit of the skylights. On the other part of this and the adjoining roof, where the ceiling joists can be got the whole length, the baulks may be placed 6 feet above the upper side of the ceiling joists, and no other struts will be required. The ceiling joists are 9 inches deep by $2\frac{1}{4}$ inches thick; baulks 6 inches deep by 2 thick, and the rafters $8\frac{1}{2}$ inches deep at the bottom, and 7 inches at the top, by $2\frac{1}{4}$ thick; ridge board, 1 foot 2 inches deep by $1\frac{1}{2}$ inch thick. The cantalivers, gutters, pendants, &c., are detailed, PLATE V.

The Section of the roof over the bed-rooms F and E, is cut through the centre of the ridge board, showing the rafters to the under side of the ceiling joists, which are 5 feet 3 inches from the top of the ridge board.

PLAN OF ROOF.—In order to make the drawing as comprehensive as possible, the Plan is arranged in such a manner as to show one half of the roof finished, and the other half in the naked rafters. The space between the rafters is 1 foot 4 inches, those at the gable ends being kept close to the wall, and the cross bearers forming the projection over the gable walls are joined to this rafter by a mortice and tenon, and checked upon the rafter shown on the wall, which must be properly bedded with lime, in the same manner as a wall plate. The rafter forming the extremity of projection is framed to the cross bearers, and likewise to the pendants, which are hung upon the ridge board, as shown in the Section, and also to the scantling, forming the extremity of projection over the side walls. The pole plates, which are made fast to the cantalivers, are described under PLATE V.

Where the roofs on the lower parts of the building come in connection with the higher walls, the ceiling joists will run into the wall, forming the gutter, and the rafters will rest upon the ceiling joists, so as to range with the rest of the roof; by so doing it will give more height to the rooms, than by bringing the rafters down to the walls, and likewise the breadth of the gutters will render them less liable to be choked up.

The roofs of the dormer windows are supported on a beam or pole plate, running level between the front wall and the rafters of the principal roof; this beam may be 6 inches broad and 4 inches thick; the space between the front wall and the roof may be built up with brick, and finished on the outside with Roman cement, so as to correspond with the rest of the wall.

Although the roof forms a very conspicuous feature in the appearance of a Villa, it should be constructed not only to give a pleasing effect, but likewise to bind and strengthen the walls, and to serve the purposes for which they are chiefly intended, viz., that of keeping the walls and the interior of the building perfectly dry.

PLATE V.—DETAILS OF BARGE BOARDS AND CORNICES.

THE Plan marked A represents the manner in which the cantalivers are finished, and likewise how the rafters and ceiling joists are framed. The cantalivers are 2 feet 10-inches long, and 7 inches deep, by $2\frac{1}{2}$ thick, projecting 1 foot 6 inches over the walls, nailed to the wall plate, which is 9 inches broad by $1\frac{1}{2}$ thick. The pole plate is 7 inches deep by $4\frac{1}{2}$ thick, to be properly fastened to the cantalivers, and checked into the ceiling joists. The rafters should be checked so as to rest upon the ceiling joists, in order that they may throw no pressure on the cantalivers. The upper member of the eave's cornice forming the gutter may be made of wood, but cast-iron would be preferable for durability, and also for binding the roof.

The drawings marked B and C, are designs for barge boards, pendants, and drops, as shown on the Elevations, PLATES I., II., and III., the tracery and ornamental part of which should be cast-iron. It will also be understood by the Elevations where the pinnacles D and E are to be placed.

F, mullion betwixt the entrance door and side lights; the small column on this mullion to have a base and capital, as shown on the Elevation, PLATE I.

G, Details of chimney stalks.

H, cornice and cope of the enriched battlement of the porch.

K, water tables and window jambs.

PLATE VI.—DETAILS OF ORIEL WINDOW.

THE drawing marked A is part of the plan of an oriel window, showing the form of the stone mullions, and likewise the window cases, sash frames, shutters, architraves, &c. As the different parts of finishing are all carefully drawn to the scale, it will be unnecessary to describe their dimensions.

Those who have had any experience in finishing oriel windows, according to the method generally used of hinging the back-flaps to the shutters, must have found great difficulty arising from the manner in which the weight or strain of the back-flaps falls on the side of the shutter, in keeping them from warping, which, of course, must cause the back-flaps to fall down at the bottom, and strike against the window breast. As a remedy against that, I have endeavoured to illustrate, by the drawings A, C, and E, how the window may be shut in, by having the shutters hinged to the window case in the usual manner, to close in the diagonal space; and by having a shutter hung by weights, similar to the sash frames, to draw up from behind the window breast, to close in the space between the diagonal shutters, which are represented on the drawing as being shut, the dotted lines showing their position when open.

C is a section cut through the centre compartment of the window, showing part of the elevation of the diagonal compartment. The section shows the position of the shutter when down; the upper member of the base moulding is fixed to the shutter, so as to prevent the joint being seen; and as the other side of the shutter forms a check in the cope, this joint, if properly made, will not be observed. The section also shows the base forming the window breast, the floor, trimmer joist, and part of the partition on the sunk floor, for closing in the shutter, and also the lining between the shutter and the stone wall. The section of the stone wall gives the form of the base and window sill, and also the sills of the case and sash frame.

The plan D is part of the sunk floor, showing the form of the pulley stiles, which serve also for door frames; likewise the shutter, back lining, and doors, for giving access to the pulley stiles and shutters, so that any repairs may be made when required.

E is part of the elevation of the shutters and friction rollers, and a section of the pulley stile. The dotted line on the bottom rail of the shutter represents the upper side of the window breast, when the shutter is drawn full up, leaving $5\frac{1}{2}$ inches of the bottom rail in the frame or pulley stile for the purpose of keeping it steady. The iron brackets and friction rollers will require to be carefully fixed to the shutter, so as to keep it perpendicular; and the shutter must be made to run quite free in the grooves of the pulley stiles, resting wholly on the friction rollers. It is intended that the upper rollers should run in the grooves made for receiving the cords for the weights, and the lower rollers to be as thick as the shutter, having a channel in the edge, that they may pass over the cords. By having leather glued on the bottom of these grooves, it would prevent, in a great measure, the noise caused by the rollers, and likewise save the wood from being cut by the friction.

This method of shutting oriel windows will require no iron fasteners except a bolt or latch on the diagonal shutters, in order to prevent the centre shutter from being pushed down. In houses having a sunk floor, where the shutters can be brought down without causing any inconvenience below, the method may be adopted without making much difference in the expense.

B is part of the inside elevation of the centre compartment of the window, representing the one half finished and the other unfinished, showing the manner in which the sash frames and the cases are joined up, and also where the different centres are placed for describing the arches; the length of radius for each will be ascertained by the scale.

The unfinished part of the case represents the pulley stiles of the centre mullion, without the parting beads and inside lining, showing how they may be framed to the sill and lintel, and also how the Gothic tops may be framed up. After having joined the sill, lintel, and pulley stiles together, as shown on the Plan, nail the outside lining to the sill and pulley stile, making a tongued joint at the spring of the arch; then fix pieces of wood, of the same thickness as the sash frames, into the spaces for the upper sash, moulded and joined to the lintel and pulley stile in the same manner as shown on the unfinished part of the case.

The outside linings for the Gothic tops will be moulded so as to correspond with the cusps of the stone tracery, showing the same margin as on the upright mullions. The parting bead will be moulded similar to the outside lining, and the same thickness as the upright parting bead, which will join it at the spring of the arch; these linings to be properly nailed down to the centre piece forming the space for the upper sash. The pieces forming the soffit over the lower sash will also be of the same thickness as the sash frames; they may be moulded by adding the projection of the parting bead to the length of the different radii by which the parting bead was drawn, thus giving the parting bead the same margin round the cusps as on the pulley stiles; they should be joined to the lintel and pulley stiles in the same manner as the piece over the upper sash shown on the Elevation, and all the different pieces should be properly nailed together; the inside lining will also be joined at the spring of the arch, moulded as shown on the Plan A, and Elevation B.

The columns, bases, capitals, and the mouldings forming the arches, may all be planted on after the case is fixed into its place.

The upper sash frame to be joined at the spring of the arch with cross tongues glued into the joint, and also a screw bolt, as shown on the drawing. The joint at the top of the arch will also be cross-tongued, and screwed from the upper side. The weights in the centre mullion for balancing the sashes, will require a pulley fixed in the top, as shown on the drawing, so that one weight may balance two sashes.

F is a section of the window astragal, full size.

PLATE VII.—BASE, SURBASE, AND DOOR FINISHING.

THE drawing marked A, is a section of door finishing for the dining-room, as represented on the Section, PLATE IV., showing the form of the cornice, architraves, top rail, mouldings, and part of the door panel, and part of the soffit of the jamb lining, and also the door frames, lath strap, and part of the stone wall. This door finishing may also suit the drawing-room and parlour.

B is a section of the base, surbase, and dado lining for the dining-room. The plinth of the base is 10 inches high; the framing of the dado lining is 5 inches, and the panel 11 inches broad; the size of the different mouldings will be ascertained by the scale.

C is a section of the door finishing in the entrance hall. The columns to have bases and capitals, as shown on the Section, PLATE IV.

D is part of the elevation of one of the doors in the entrance hall, showing the form of the upper panels, which are filled in with three cusps and two semi-cusps, denominated by the name of a *quadrefoil arch*. The framing and mouldings of these doors may be the same as shown on the Section A.

The groined ceiling, PLATE VII., is intended for the porch. In order that the description of the groined ceiling may be more easily understood by those unacquainted with their construction, it will be necessary to make a few observations on groins in general.

Groins are the intersections of the surfaces of two arches crossing each other. They may be constructed in various forms and of different materials, such as brick, stone, or wood and plaster. When constructed of brick or stone, they require to be supported upon wooden frames or centres, forming the convex surface required for each vault; those frames or centres are drawn by the same manner of lines as those shown on the Plan, with the exception of the diagonal ribs, which are not required, because in the centering for groins one portion of the centre is formed to the surface of its corresponding vault, without any regard to the cross arches, so that the boards may run the whole length, the upper side of which will form a complete cylindric, or cylindroidic surface. The centerings for the cross arches are formed in like manner to their corresponding vaults, and part of the ribs are fixed on the top of the boarding, to correspond with their respective vaults, and boarded in so as to intersect the other, and form the entire surface of the groin required.

Cellars are frequently groined with brick or stone, and sometimes all the rooms of the basement stories of buildings.

Groined arches have various names, according to the surfaces of the two geometrical bodies which form the vault.

A *conic groin* is formed by the intersection of one portion of a cone with another. When one conic vault intersects another of greater height, the arch formed by the intersection is called a *cono-conic arch*.

A *spheric groin* is that which the intersection of two portions of a spherical vault produces. When an arch is formed by the junction of a spheric vault with a cylindric vault, it is called a *cylindro-spheric groin*, if the spheric portion be of less height than the cylindric; but if the spheric portion be of greater height than the cylindric, the arch is called a *sphero-cylindric groin*.

A *cylindric groin* is formed by the intersection of one portion of a cylinder with another. When two unequal cylindric vaults intersect each other a *cylindro-cylindric groin* is formed.

An *equi-angular groin* is formed when the several axes of simple vaults form equal angles around the same point on the same plane.

A *rectangular groin* is formed when the axes of the simple vaults are in two vertical planes at right angles to each other.

A *multangular groin* is formed by three or more simple vaults, piercing each other at the same height, so that if the several solids which form each simple vault be respectively applied to succeeding portions of the groined surface, every portion of the groined surface will have formed successive contact with certain corresponding portions of each of the solids.

The axis of each simple vault, forming the intrados of a groined vault, is the same with the axis of the geometrical solids, of which the intrados of the groin are composed.

The wood framing of plaster groins is called ribs; the diagonal ribs extend between the two opposite angles of the room. The body ribs form the respective arch on the perpendicular walls, and the jack ribs are portions of the body rib, but shorter than the whole length; they are placed upon the diagonal ribs, so that the lath may be equally stiff to sustain the plaster forming the surface of the respective vaults required to complete the groined ceiling. Plaster-groined ceilings, such as that shown on PLATE VII., are intended more for ornament than any real useful purpose.

Plaster groins are particularly well adapted for halls, porches, corridors, and passages in Gothic buildings, as they combine all the characteristic beauties of lightness and strength, and when judiciously ornamented with mouldings, corbels, and tie-drops, they never fail to give a pleasing effect; and as the construction of plaster groins is simple, and having no more weight on the walls than any other ceiling, whereas, if such ceilings were constructed of brick or stone, in the upper stories of buildings the lateral pressure of the arches would have a tendency to thrust out the walls.

On the drawing, PLATE VII., A, B, C, and D, represent the form of the Porch, 10 feet 9 inches by 9 feet 6 inches. A B E F is the given body arch, which is drawn from four centres the same as shown on the corresponding arch C D, where the centres and different radiuses are marked by dotted lines. Having drawn the plan of the room full size on some convenient place, raise the given arch, so that the side of the plan A B may form a base line to the arch; then draw the diagonal lines on the Plan; divide the given arch into any number of equal parts on the curved line, as shown from A to F; draw ordinates from the divisions on the curved line, perpendicular to the base, intersecting the diagonal line A K D. To find the mould for the body arch on the side A C, from the points where the ordinates through A B intersect the diagonal line A K D, raise ordinates perpendicular to A C, and transfer the heights of the different given ordinates, making them the same from the base line A C as they are from A B, as shown on the Plan by dotted lines; trace the curved lines through the given points, which may be done by stitching nails into the points and bending a thin slip of straight-grained wood round the nails; this will produce the arch required; having found one half by this method, the other half may be found by reversing the mould, or by drawing parallel lines, making them of the same length on each side of the centre line, as shown on the Plan.

The diagonal ribs may be found in like manner, by taking the diagonal line B C for the base of the arch, and drawing perpendicular ordinates from the intersection of the corresponding ordinates to the same height from the base, as on the body ribs, and tracing the curve through the points in the manner already described. To find the length of the jack ribs, draw them on the Plan in their respective positions, as shown on the drawing. The perpendicular dotted lines drawn from the seat of the jack rib, on the diagonal rib, show what requires to be cut from the bottom of the mould; the perpendicular line gives the down bevel, and the side bevel is found by applying a bevel to the line of the jack rib on the Plan, and extending it to the angle of the diagonal rib. The bevel on the edge of the diagonal ribs may be drawn by keeping the mould at the same height at top and bottom as when the outline was drawn, making

the bottom of the mould correspond with the lines drawn on the bottom of the rib, which are found by taking the bevels from the plan.

These ribs are generally formed in two thicknesses of wood, the one side breaking joint with the other. In some cases, in order to save work and materials, the spaces between the diagonal ribs and the body rib attached to the wall are filled in with straight joists, and the lath bent so as to form the curve of the vault. This method, although less expensive, is not, however, to be recommended, as the plaster never stands so well on bent laths.

In Gothic groins, such as this, the ribs should be joined at the top to a ridge board, as shown on the drawing; it is likewise a good method to form the bottom of the angle and side ribs in one piece of wood, about 4 inches square; these pieces being moulded to correspond with the different vaults, so as to form the groined angle of the ceiling, serving as a bracket to support the ribs.

DESIGNS FOR TWO COTTAGES IN THE GOTHIC AND ITALIAN STYLES.

PLATE VIII.

COTTAGE IN THE GOTHIC STYLE.—*Figures 1, 2, and 3,* are plans for a small Cottage in the *Gothic Style*. This style is more suitable for edifices of a limited extent than even a more classical or purer style, in which grandeur and magnificence are generally the leading principles; whereas, in the present design, the object to be obtained is a combination of elegance and simplicity.

GROUND PLAN, Figure 1.—The space marked A represents the *Kitchen*, 14 feet 10 inches by 13 feet 6 inches.

B, a small *Bed-closet*, 9 feet 4 by 6 feet 2 inches.

C, *Parlour*, 15 feet by 13 feet 6 inches.

D, *Bed-room*, 13 feet 3 by 10 feet 6 inches.

FRONT ELEVATION, Figure 2.—The length is 40 feet 9 inches; including the gable end, 17 feet 4 inches. The height from the ground to the gable top is 19 feet 6 inches, and to the top of the chimney stalks, 22 feet 9 inches, and from the ground to the top of the embrasures on the side walls, 13 feet.

The front door is 7 feet 10 inches high by 3 feet 6 inches wide, raised 12 inches above the level of the ground.

The windows are divided into two compartments by a stone mullion 6 inches thick, each compartment being 6 feet high by 1 foot 9 inches wide; the window sills are 3 feet above the level of the ground; the windows in the gable ends are crowned by water tables, which reach 1 foot 2 inches below the top of the windows. The small windows in the gable ends are 2 feet high by 1 foot wide; these windows will admit sufficient light to the garret, which is fit only for a store room.

SECTION, Figure 3.—The section is cut in a straight line through the centre of the kitchen and parlour windows, showing the roof and inside finishing of the different rooms. The height

of the rooms is 10 feet; the height of the doors is 7 feet 3 inches; the room doors are 3 feet, and the press doors 2 feet 9 inches wide.

The different dimensions of the finishing, ceiling joists, rafters, and sleeper joists, may be ascertained by reference to the scale.

COTTAGE IN THE ITALIAN STYLE.—*Figures 4, 5, and 6,* are Plans for a Small Cottage after the *Italian Style*. Although this cottage be of small dimensions, and simple in detail, it might be a very suitable design where comfort and convenience are the principal objects to be obtained, and, although having but little claim to architectural grandeur, yet, if placed in a good situation, would have a chaste appearance.

GROUND PLAN, *Figure 4.*—The space marked A represents the *Kitchen*, 14 feet by 11 feet 4 inches, the fixed bed in the Kitchen may be concealed by a door, if required.

B, *Bed-room*, 11 feet 6 inches by 9 feet 10 inches.

C, *Parlour*, 14 feet square.

FRONT ELEVATION, *Figure 5.*—The length is 29 feet 9 inches, including the gable end, 18 feet. The height from the ground to the gable top is 17 feet 3 inches, and to the top of the chimney stalks, 19 feet; and from the ground on the top of the side walls, 11 feet; and to the under-side of the cantalivers, 10 feet 2 inches.

The front door is 7 feet 9 inches high, including the fanlight and transom, which together are 12 inches high by 3 feet 4 inches wide, raised 12 inches above the level of the ground.

The front windows are divided into two compartments with semicircular tops, each compartment being 6 feet high, to the top of the soffit of the arch, by 2 feet wide.

The elevation of both fronts of this cottage is exactly the same.

SECTION, *Figure 6.*—The section is cut through the centre of the kitchen window, and runs on in a line parallel with the back wall, through the different apartments, showing the form of the roof and the finishing of the Kitchen and Bed-room. The height of the rooms is 10 feet; the Bed-room window is 6 feet high by 3 feet 3 inches wide. The height of the doors is 7 feet 3 inches; the room doors 3 feet, and the press doors 2 feet 9 inches wide.

The projection of the eaves is formed by the rafters, the under side of which is lined with inch boards, and the cantalivers planted on. The projection over the gables may be formed by horizontal scantlings, framed into the rafters, and finished below, in the same manner as the eaves.

The ceiling joists are $7\frac{1}{2}$ inches deep by 2 inches thick; the rafters $7\frac{1}{2}$ broad at the bottom, and 6 at the top, by $2\frac{1}{4}$ inches thick; the ridge board is 12 inches deep by $1\frac{1}{2}$ inch thick; the sleeper joists, 8 inches deep by $2\frac{1}{2}$ inches thick; flooring, $1\frac{1}{4}$ inch thick.

DESIGNS FOR A VILLA IN THE GOTHIC STYLE.

PLATES IX.—XII.

THIS is a Villa of a medium size, yet sufficient to accommodate a genteel family. The design, owing to the irregularity of the outline, would have a bold and picturesque appearance.

PLATE IX.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A represents the *Drawing-room*, 19 feet by 16 feet 6 inches, exclusive of the window bay, 7 feet 9 inches by 3 feet 2 inches; height of ceiling, 12 feet 6 inches.

B, *Parlour or Library*, 16 feet 3 inches by 15 feet, exclusive of the recess for the book-case, 13 feet by 1 foot 4 inches; height, 12 feet 6 inches.

C, *Dining-room*, 19 feet 9 inches by 16 feet 6 inches, exclusive of the window bay, 7 feet 9 inches by 3 feet 2 inches; height, 12 feet 6 inches.

D, *Kitchen*, 15 feet 6 inches by 12 feet 9 inches, and 10 feet 6 inches high.

E, *Scullery*, 13 feet 6 inches by 11 feet; height, 10 feet 6 inches.

F, *Larder*, 8 feet 9 inches by 5 feet 6 inches.

G, *Bath-room and Water-closet*, 11 feet 6 inches by 6 feet; height, 12 feet 6 inches.

H, *Passage*, from the staircase to the different departments, 18 feet 3 inches long by 4 feet 9 inches wide, and 12 feet 6 inches high, lighted from the staircase.

K, *Passage*, communicating with the kitchen and other back apartments, 18 feet long by 4 feet 3 inches wide, and 10 feet 6 inches high, lighted from a fanlight over the kitchen door.

L, *Entrance Hall*, 10 feet 4 inches square by 12 feet 6 inches high, lighted from the staircase and fanlight over the front door.

The *Staircase* is 18 feet by 10 feet 3 inches; length of the steps, 4 feet 2 inches, rise $6\frac{1}{2}$ inches, tread 12 inches.

FRONT ELEVATION.—The whole extent of the front, including the wing (to the left), is 69 feet; the wing is 18 feet 4 inches, and the gable end 19 feet 4 inches. The height from the ground to the top of the side wall is 22 feet 8 inches, to the gable top 34 feet 6 inches, and to the top of the gables over the dormer windows 28 feet 2 inches, and from the ground to the top of the chimney stalks 39 feet.

The wing is 18 feet 9 inches from the ground to the top of the side wall, and 30 feet to the gable top.

The entrance is 4 feet 5 inches wide, raised 1 foot 6 inches above the level of the ground, ascended by 3 steps in the doorway; the door is 8 feet high to the under side of the transom, between the door and fanlight; the transom is 6 inches thick, and the fanlight 1 foot 8 inches high; the pediment, trusses, and other ornamental parts of the doorway, are shown in detail, PLATE XII.

The oriel windows are both of the same dimensions, each being 13 feet from the ground to the top of the cornice, and 15 feet 6 inches to the top of the pavilion roof; the central part of the oriel windows is divided into two compartments, each 1 foot 9 inches wide by 8 feet high; the diagonal openings are each 1 foot 2 inches wide in the clear of the reveals. The other window, on the ground floor, is divided into three compartments, each 1 foot 8 inches wide by 8 feet high.

The chamber floor windows are 17 feet from the ground; those in the principal part of the building are divided into two compartments, each 1 foot 10 inches wide by 6 feet 6 inches high; the one in the gable end is crowned with a tablet, which reaches 1 foot 8 inches below

the top of the window; and the one over the oriel window in the wing, is also divided into two compartments, each 1 foot 6 inches wide by 5 feet 3 inches high; the stone mullion, in the centre of this window, is 5 inches thick, and those in the other windows 6 inches.

PLATE X.—CHAMBER FLOOR AND END ELEVATION.

PLAN OF CHAMBER FLOOR.—The space marked A on the Plan, represents a *Bed-room*, 16 feet 6 inches by 12 feet; height of the coved ceiling, 10 feet in the centre, and 8 feet 6 inches to the upper side of the impost cornice.

B, *Dressing-room*, 12 feet, by 7 feet 6 inches, and 10 feet high.

C, *Bed-room*, 12 feet 3 inches by 11 feet 9 inches, and 10 feet high in the centre.

D, *Bed-room*, 16 feet 3 inches by 15 feet 6 inches; this ceiling can be got square 10 feet high.

E, *Bed-room*, 12 feet 3 inches by 11 feet 9 inches, and 10 feet high in the centre, and 8 feet 6 inches to the spring of the cove.

F, *Servants' Bed-room*, 16 feet 8 inches by 15 feet, exclusive of the recess for the front window, 8 feet by 2 feet; this ceiling is coved on the back and front walls; height, 9 feet in the centre, and 6 feet to the spring of the cove.

G, *Water-closet*, 5 feet 6 inches by 3 feet 3 inches.

H, *Passage*, from the staircase to the different apartments, 18 feet 3 inches long by 4 feet 6 inches wide, and 10 feet high.

The small *Lobby*, at the farther end of this passage, is 4 feet 3 inches square, lighted by a roof light.

END ELEVATION.—The whole extent of the end elevation, including the back wing, is 58 feet 2 inches. The wing to the back is 20 feet 4 inches, the lower gable end 23 feet, and the higher gable behind it 24 feet 8 inches. The projection in front of this part of the building is 4 feet 2 inches, and the projection to the back 9 feet. The height from the ground to the top of the side walls of the front projection is 23 feet 9 inches; the back wing is 21 feet 8 inches high, from the ground to the top of the side walls, and 20 feet 6 inches to the top of the roof, and from the ground to the top of the chimney stalks 25 feet. The height of the other walls in this Elevation will be ascertained by referring to the description of Front Elevation, PLATE IX.

The entrance to the back wing is 4 feet wide, raised 1 foot 6 inches above the level of the ground, ascended by 3 steps of 6 inches rise; the door is 7 feet 3 inches high, to the under side of the transom, between the door and fanlight; the transom is 4 inches thick, and the fanlight 12 inches high.

Windows.—The window in the back wing is divided into two compartments by a stone mullion, 12 inches thick, each compartment being 2 feet 10 inches wide, by 6 feet 3 inches high. The window on the ground floor, in the gable end, is divided into two compartments by a stone mullion, 6 inches thick, each being 2 feet wide by 8 feet high, crowned with a tablet, which reaches 1 foot 9 inches below the top of the window; the blank window on the ground floor in the back projection is 2 feet wide by 7 feet high. The blank window on the chamber floor is 16 feet 6 inches from the ground, and 2 feet wide by 4 feet 10 inches high; the

chamber floor window, in the gable end, is 17 feet from the ground, divided into two compartments by a stone mullion, 5 inches thick, each compartment being 1 foot 6 inches wide, and 5 feet 3 inches high.

PLATE XI.—SECTION AND PLAN OF ROOF.

SECTION—Ground Floor.—The section of the ground floor is cut through the centre of the Drawing-room A, and runs on a straight line through the Entrance Hall L, Library B, and Dining-room, C.

The section of the Drawing-room shows the sleeper joists, foot base, section of the chimney-piece, window finishing, and plaster cornice; the sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick; the foot base, including the fascia above the base moulding, is 1 foot 4 inches high; the window breasts are 2 feet high above the floor; the chimney-piece is 3 feet 4 inches high in the clear, and 4 feet 9 inches high to the top of the shelf; the plaster cornice and frieze is 11 inches on the wall, and 9 inches on the ceiling.

The section of the Entrance Hall shows the archway leading to the staircase, 5 feet 8 inches wide, and 10 feet 4 inches high, to the top of the soffit of the arch; part of the stair and staircase window are seen through the archway; the foot base, which should be stone, is 11 inches high; the ceiling is divided into 9 panels, sunk 5 inches, the breadth of the beams being 9 inches.

The section of the Library shows the sleeper joists, foot base, dado lining, and surbase door, and door finishing plaster cornice, and likewise a section of the book-case. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick; the foot base is 12 inches high; the dado lining 1 foot 11 inches broad, and the surbase 5 inches; the door is 3 feet 5 inches wide, by 8 feet high; the under part of the book-case corresponds with the dado lining; the upper part may have glass or trellis doors; the plaster cornice and frieze is 1 foot 2 inches on the wall, and 8 inches on the ceiling.

The section cuts through the doorway between the Library and Dining-room, showing the jamb lining, which is panelled to correspond with the doors; the foot base in the Dining-room is 1 foot 4 inches high, including the fascia, which is 7 inches broad; the recess for the side-board is 7 feet wide by 9 feet 2 inches high, and 12 inches deep; the chimney-piece is 3 feet 4 inches high in the clear, and 4 feet 8 inches high to the top of the shelf; the plaster cornice is 8 inches on the wall, and 6 inches on the ceiling.

Foundations.—The depth to which the foundations and dwarf walls should be carried, and likewise the arrangement of the drains and cess-pools, can only be ascertained from the nature of the ground on which the building may be erected; but particular attention should always be paid to drainage, ventilation, and proper foundations, as the comfort and stability of the superstructure depends, in a great measure, upon those parts of the building.

Chamber Floor.—The section of the chamber floor is taken on a line perpendicular with the section line on the ground floor, representing the back walls of the Bed-rooms, A, D, E, and F. The joists for the chamber floors are 11 inches deep, by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base in the Bed-room D is 11 inches high, and in the other rooms

it is 9 inches high; the Bed-room doors are 3 feet wide, and 7 feet high; the window breasts are 2 feet 2 inches high from the floor; the chimney-piece in the Bed-room F, is 3 feet high in the clear, and 4 feet high to the top of the shelf; in this room the form of the window shutters is also shown.

Roof.—The section of the roof runs on a line perpendicular with the ridge, showing the different rafters to the under side of the ceiling joists, which are $8\frac{1}{2}$ inches deep by $2\frac{1}{4}$ inches thick; baulks 6 inches deep by 2 inches thick, and the rafters $8\frac{1}{2}$ inches deep at the bottom, and 7 inches at the top, by $2\frac{1}{4}$ inches thick; ridge boards 12 inches deep by $1\frac{1}{2}$ inch thick. The ceiling joists over the Bed-room F, are only 7 inches deep by $2\frac{1}{4}$ inches thick. The valley rafters are 10 inches deep at the bottom, and $8\frac{1}{2}$ inches at the top, by 3 inches thick; the ceiling joists of ditto are 10 inches deep by $2\frac{1}{2}$ inches thick, and the baulks 6 inches deep by $2\frac{1}{4}$ inches thick.

PLAN OF ROOF.—The plan of the roof is drawn so as to show the one half finished, and the other half in the naked rafters; the space between the rafters is 1 foot $3\frac{1}{2}$ inches, those at the gable ends being kept close to the wall. The wall plates are 10 inches broad, by $1\frac{1}{2}$ inch thick; they should be half-checked at the joinings, and properly bedded with lime.

The roof light over the lobby, on the chamber floor, is 3 feet by 2 feet 3 inches in the clear. The roof of the dormer window, on the wing to the left, in the front elevation, is supported on two beams or pole plates, extending between the front wall and the rafters of the principal roof; those beams may be 6 inches broad, and 4 inches thick; the perpendicular spaces between the front wall and the roof may either be closed in with brick, or lath and plaster, and finished on the outside with mastic, so as to correspond with the rest of the wall. The roofs of the other dormer windows are supported by the rafters of the principal roof, which may rest upon the ceiling joists.

The gutters, as shown on the finished part of the roof, are formed in the cornice, and properly covered with lead. The water can be carried from the roof by cast-iron pipes built into the wall, or by lead pipes on the outside.

PLATE XII.—DETAILS OF FRONT DOORWAY AND RECESS IN DINING-ROOM.

THE drawing marked A, shows part of the front elevation of the doorway. The door framing may be $2\frac{1}{4}$ inches thick; the centre stiles, exclusive of the bead, are $5\frac{1}{2}$ inches broad; and the outside stiles and top rails are 6 inches broad, the frieze rails $5\frac{1}{2}$ inches, and the lock and bottom rails 11 inches broad; the panels are $\frac{5}{8}$ of an inch thick, with planted mouldings on both sides, the inside corresponding with the room doors. The fanlight has margin stiles, with a sunk bead in the centre, similar to the door; the framing of the fanlight is 2 inches broad by $2\frac{1}{4}$ inches thick; and the intersecting bars are $\frac{5}{8}$ of an inch thick. The outside checks for the door and fanlight are 5 inches broad, and $\frac{5}{8}$ of an inch thick. The pilasters on each side of the doorway are 13 inches broad, projecting 3 inches from the wall. The pendants in front of the trusses, and centre of the pediment, and also the pinnacles, may either be cast-iron or wood, painted to correspond with the stone, to which they may be fastened with screw bolts.

The drawing marked B, is a part of the side elevation of the doorway, showing the projec-

tion from the wall, and also a side view of one of the trusses; the trefoil panels in the trusses may be sunk $\frac{3}{4}$ of an inch, with cavetto mouldings, and the quatrefoil panels in the frieze may be sunk $1\frac{1}{2}$ inch, with cavetto and fillet mouldings. Other dimensions of the different ornamental parts will be ascertained by reference to the scale.

The drawing marked C, is a section and side elevation of the recess in the Dining-room, giving a side view of one of the trusses, and also a section of the foot base, cornice, and other finishings of the recess.

The drawing marked D, gives a front view of one of the trusses, and likewise the elevation of a portion of the frieze and cornice, and one of the pilasters; the pilasters and frieze are each $10\frac{1}{2}$ inches broad by 2 inches thick; the lower part of the foot base of the room forms the base of the pilasters, the upper fascia butting against it.

DESIGNS FOR A VILLA AFTER THE GRECIAN STYLE.

PLATES XIII.—XVII.

GRECIAN architecture has long been admired for its elegance of outline, and also for the pleasing combination of magnificence and simplicity displayed in its ornamental details, which never fail to produce a chaste appearance, when judiciously applied, either in public or private buildings. Grecian Villas are well adapted for suburban situations, where the surrounding scenery is generally in unison with that style of architecture.

PLATE XIII.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space A, on the ground plan, represents the *Drawing-room*, 21 feet 9 inches by 15 feet 9 inches; height of ceiling, 14 feet to the bottom of the panels.

B, *Parlour*, 16 feet by 13 feet 4 inches; height, 13 feet 6 inches.

C, *Library*, 16 feet by 13 feet 4 inches, and 13 feet 6 inches high.

D, *Dining-room*, 20 feet 9 inches by 15 feet 9 inches; height of ceiling, 14 feet to the bottom of the panels.

E, *Bed-room*, 15 feet by 12 feet 9 inches; height 12 feet 9 inches.

F, *Dressing-room*, 10 feet 3 inches by 7 feet 6 inches; height, 12 feet 9 inches

G, *Bath-room*, 14 feet 6 inches by 8 feet 4 inches and 13 feet 6 inches high.

H, *Servants' Waiting-room*, 10 feet by 8 feet; height, 12 feet 6 inches.

I, *Plate-room*, 5 feet by 3 feet 6 inches, and 11 feet high, arched with stone; there should also be an iron door on this room, in order to make it more secure.

K, *Kitchen*, 15 feet by 12 feet 8 inches; height, 12 feet 9 inches.

L, *Scullery*, 10 feet by 6 feet 9 inches, and 12 feet 9 inches high.

M, *Pantry*, 7 feet by 3 feet 6 inches; this ceiling may be brought down to 10 feet.

N, *Larder*, 8 feet 3 inches by 4 feet; height, 13 feet 6 inches.

O, *Closet*, 4 feet square by 12 feet high.

P, *Closet*, 5 feet by 4 feet 8 inches, and 12 feet 9 inches high.

R, *Closet*, 4 feet square by 12 feet high.

S, *Water-closet*, 6 feet by 4 feet; the cistern over the water-closet may also serve the bath-room.

T, *Vestibule*, 9 feet 4 inches square, and 13 feet 6 inches high, from the floor to the bottom of the panels in the ceiling.

U, *Entrance-hall*, 9 feet 4 inches by 5 feet; height 13 feet 6 inches, lighted from a fanlight above the door, and also from the staircase by a glass door between the hall and vestibule.

The *Staircase* is 20 feet 6 inches by 10 feet 9 inches; length of the steps; 4 feet 2 inches; rise, nearly $6\frac{1}{2}$ inches; tread, 11 inches.

The *passage* from the staircase to the lobby at the Dining-room door is 16 feet long by 5 feet wide, and 13 feet 6 inches high; the *lobby* is 7 feet by 6 feet; height, 12 feet 9 inches, lighted by a cupola, as shown on the plan by dotted lines. The *passage* communicating with the lobby and kitchen is 7 feet long by 4 feet 3 inches wide, and 12 feet 9 inches high.

The *passage* from the staircase to the Drawing-room is 26 feet long by 5 feet wide, and 13 feet 6 inches high from the staircase to the archway through the stone wall, the remainder being 12 feet 9 inches high, lighted by a cupola, as shown on the plan by dotted lines. The *passage* branching off to the Bed-room is 7 feet 10 inches long by 4 feet 3 inches wide, and 12 feet 9 inches high.

FRONT ELEVATION.—The extent of this building, from the extremity of one wing to that of the other, is 79 feet; extent of each of the wings 20 feet, and the body of the building 39 feet. The wings project 5 feet 6 inches in front of the body of the building.

The colonnade extends the whole length of the building between the wings. The columns are of the *Grecian-Ionic* order, raised upon a plinth 1 foot 6 inches above the level of the ground, and stand 3 feet clear from the wall. The height of the columns is 12 feet 4 inches, being 9 diameters high. The pilasters on the wings are placed double, so that the one pilaster may range with the columns, and the other project $13\frac{3}{4}$ inches in front of them.

The entablature extends the whole length of the building in front, and is continued along the front compartment of the wing at each end; the height of the entablature is 3 feet 2 inches, above which is a stone railing, 2 feet 9 inches high, inclosing the balcony.

The height from the level of the ground to the top of the railing is 19 feet 9 inches, and to the top of the blocking-course 31 feet 9 inches; to the top of the roof 34 feet 6 inches; and from the ground to the top of the chimney stalks 35 feet.

The entrance is 4 feet 5 inches wide, raised 2 feet above the level of the ground, ascended by 4 steps, one of which is in the doorway; the door is 8 feet high to the under side of the transom between the door and fanlight, being 7 inches thick, and the fanlight, 2 feet high.

The windows under the colonnade are 8 feet 9 inches high, and 4 feet wide; the windows in the wings are 9 feet 2 inches high, and 4 feet 3 inches wide. The architraves round these windows are 11 inches at the bottom, and 9 inches at the top, with a break of 2 inches at the

top. The chamber-floor windows are 18 feet 6 inches from the ground; their height is 7 feet 6 inches, width 3 feet 9 inches; the architraves round the chamber-floor windows are similar to those on the ground floor.

PLATE XIV.—PLAN OF CHAMBER FLOOR AND BACK ELEVATION.

PLAN OF CHAMBER FLOOR. The space marked A, on the chamber-floor plan, represents a *Bed-room*, 16 feet 8 inches by 13 feet 6 inches; height of ceiling, 11 feet 3 inches.

B, *Dressing-room*, 12 feet by 10 feet; height, 11 feet 3 inches.

C, *Bed-room*, 16 feet 8 inches by 13 feet 6 inches; height, 11 feet 3 inches.

D, *Bed-room*, 14 feet 9 inches by 12 feet 10 inches; height, 11 feet 3 inches.

E, *Bed-room*, of the same dimensions as the former.

F, *Water-closet*, 7 feet 9 inches by 4 feet 10 inches, and 11 feet 3 inches high.

G, *Closet*, 5 feet 8 inches by 4 feet; height, 11 feet 3 inches.

H, *Housemaid's Pantry*, 7 feet 6 inches by 4 feet 10 inches, and 11 feet 3 inches high.

K, *Passage*, from the stair to the different apartments, 21 feet 9 inches long, including the stair landing, which is 5 feet three inches wide, the remainder of the passage being 4 feet 10 inches wide, and 11 feet 3 inches high.

The balcony in front over the colonnade is 3 feet 6 inches wide, between the parapet and front wall; the balcony is on a level with the roofs of the front compartments of the wings, which are shown on the plan as covered with lead; the back compartments of the wings, being lower, may be covered with slate.

BACK ELEVATION.—The extent of the back elevation, including the wings, is 76 feet $8\frac{1}{2}$ inches, exclusive of the projection on the front compartment of the wings, which is $13\frac{3}{4}$ inches on each wing. The extent of each of the wings to the back is 18 feet $10\frac{1}{2}$ inches. The body of the building between the wings is 39 feet, and above the wings it extends to 42 feet 4 inches, being also the same on the Front Elevation.

The wings are 17 feet 10 inches high from the level of the ground to the top of the blocking-course, and to the top of the roof 19 feet 10 inches. The different heights of the body of the building are the same as described on the Front Elevation.

The entrance door in the wing to the left is 4 feet wide, raised 2 feet above the level of the ground, ascended by 4 steps, two of which are in the doorway; the door is 7 feet 9 inches high to the under side of the transom, between the door and fanlight; the transom is 7 inches thick, and the fanlight 2 feet 2 inches high.

The window in the wing to the left is 8 feet high, and 3 feet 3 inches wide; the window in the wing to the right is 8 feet high, and 4 feet wide; the windows on the ground floor, in the body of the building, are 8 feet high, two of them are 3 feet 9 inches wide; the other, with the corresponding blank window, are 1 foot 7 inches wide.

The staircase window is 12 feet from the ground, divided into three compartments by a stone mullion 1 foot broad; the centre compartment is 3 feet 9 inches wide, and each of the side compartments 1 foot 4 inches wide, and 13 feet 2 inches high.

The chamber-floor windows are 18 feet 6 inches from the ground; height, 7 feet 6 inches

by 3 feet 7 inches wide; the blank windows, which are the same heights from the level of the ground as the other windows, are 1 foot 6 inches wide, and 7 feet 6 inches high.

PLATE XV.—SECTION AND DETAILS.

SECTION, Foundations and Dwarf Walls.—The Section of the foundations and dwarf walls are shown to a depth which may be sufficient for the front part of the building, but it is intended to have beer and spirit cellars below the back part, with a stair leading to them from the principal staircase.

Ground Floor.—The section of the ground floor is cut through the different apartments on a straight line, 17 feet 6 inches from the front walls in the Drawing-room A, and Dining-room D.

The section of the Drawing-room A, shows the sleeper joists, foot base, door and window finishing, plaster cornice, and ceiling. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick; the foot base and door finishing are shown in detail below. The window breasts are 2 feet high above the floor; the plaster cornice, including the frieze, is 1 foot 4 inches high, to the under side of the beams of the ceiling; the ceiling is divided into 20 panels, sunk 5 inches, breadth of beams 11 inches.

The section of the Parlour B, shows the sleeper joists, doors, and door finishing, foot base and plaster cornice. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick; the doors are 8 feet high, the room doors are 3 feet 6 inches wide, and the press door 3 feet 3 inches; the foot base is shown in detail, under. The plaster cornice, including the frieze, is 1 foot on the wall, and 5 inches on the ceiling.

The section of the Vestibule shows part of the stair and staircase window, and also the columns and pilasters forming the entrance to the staircase; the columns are 10 feet 9 inches high, and their diameter is nearly 13 inches, being one-tenth of the height. The capital, and part of one of the columns, is shown in detail in PLATE XVI. The base may be similar to the one shown in the Ionic order, Plate XVI. The entablature over the columns is 2 feet 8 inches high; the ceiling is divided into 9 panels, sunk 4 inches; breadth of beams, 10 inches. The doors and other finishings, shown in the section of the Library C, are of the same dimensions as those described in the Parlour.

The section of the Dining-room D, shows the door and window finishing, foot base, plaster cornice, and ceiling. The room door is 8 feet high by 3 feet 8 inches wide; and the press doors are 8 feet high by 3 feet 5 inches wide. The doors, architraves, and also the foot base, are shown in detail below. The window breasts are 2 feet high above the floor; the plaster cornice is 11 inches high, to the under side of the beams of the ceiling; the ceiling is divided into 20 panels, sunk 6 inches; breadth of beams, 12 inches.

Chamber Floor.—The section of the chamber floor is taken on a line perpendicular with the section line on the ground floor, representing the back walls of the Bed-rooms A, B, and C. The joists for the chamber floor are 11 inches deep by $2\frac{1}{2}$ inches thick. The foot base in the different rooms is 11 inches high; the Bed-room doors are 7 feet 6 inches high by 3 feet 2 inches wide.

The plaster cornice, in the rooms A and C, is 11 inches on the wall, and 6 inches on the ceiling; and in the room B, it is 6 inches on the wall, and 4 inches on the ceiling. The ceiling

joists are 7 inches deep by 2 inches thick, placed 1 foot $3\frac{1}{2}$ inches apart, between the centres hung from the tie-beams of the roof.

Roof.—The Section of the roof shows one of the principal couples; the tie-beam is 12 inches by 6 inches; queen-posts, 7 inches by 6 inches; collar-beam, 11 inches by 6 inches; struts, 4 inches by 6 inches; principal rafters, 11 inches at the bottom, and 9 inches at the top, by 6 inches thick; horizontal rafters, 8 inches deep by $2\frac{1}{2}$ inches thick. The joists for the platforms over the wings are 11 inches deep by $2\frac{1}{2}$ inches thick, covered with flooring $1\frac{1}{4}$ inch thick.

DETAILS.—The drawing marked A, is a section of part of the Dining and Drawing room doors and architraves, showing also a section of the door cornice in the Drawing-room, and a side view of one of the trusses. The drawing marked B, shows part of the front elevation of one of the Drawing-room doors, architraves, and cornice, and one of the trusses. The drawing marked C, is a section of the foot base for the Dining-room; and the drawing marked D, is a section of the foot base for the Drawing-room.

PLATE XVI.—GRECIAN-IONIC ORDER AND DETAILS.

GRECIAN-IONIC ORDER.—The Ionic is the second in the list of the three Grecian orders, being next to the Doric, which is the oldest amongst the Greeks. It originated amongst the Ionic colonies of Lesser Asia. The Ionic is generally thought to be more delicate and graceful than the Doric, and more majestic than the Corinthian. As there is a number of different examples of the Ionic order amongst the remains of Grecian architecture, it may be proper to state, that the one adopted for this villa is taken from the temple on the river Ilissus at Athens, with the exception of the base, which is in imitation of the Attic base of the Romans, which, in the estimation of the greater part of modern architects, is preferable to the antique Ionic base.

The different members of the base, shaft, capital, and entablature, are proportioned from a scale taken from the diameter of the column, which is divided into 60 minutes or parts, and likewise into modules of 30 minutes, being equal to a half diameter. It will also be observed that there is a scale of inches given on the drawing, in order that the size of the different members may be ascertained in feet or inches; this scale is drawn to the exact length of the scale of minutes, and divided into the number of feet or inches contained in the diameter of the column, which must be found before any part of the orders can be detailed.

To find the diameter of the column, take the height from the base of the column to the top of the entablature, which, on the villa, PLATE XIII., is 15 feet 6 inches, deducting 1 foot $3\frac{1}{4}$ inches from the plinth; then find the height of the entablature, by dividing the 15 feet 6 inches by 5, which will give 3 feet $1\frac{1}{4}$ inch; this is the general proportion of the orders; but as this entablature is a little more than one-fourth of the height of the column, it may be 3 feet 2 inches, which will leave 12 feet 4 inches for the column; this, divided by 9, gives 1 foot $4\frac{1}{3}$ inches, which is the diameter at the bottom of the shaft of the column, and likewise the length of the scale of inches. The heights of the different members in the order are marked in minutes, and also the projections from the centre of the column.

DETAILS.—The drawing marked A, is the elevation of an ornamental capital, and part of a column intended for the Vestibule. The column is 10 diameters high, including the base and capital; the shaft is 60 minutes at the bottom, and 50 at the top, divided into 24 flutes; the base may be the same as the one given in the Ionic order.

The drawing marked B, is the plan of one quarter of the capital, and C, is the plan of one quarter of the column, showing the form of the fluting; the fillets, or intervals between the flutes, are one-third of their width.

The figure marked D, shows the method of drawing the elliptical flutes; the width of the flute is divided into 4 parts, one-fourth being the length of the radius, for describing the ends of the ellipse; through these centres draw radii, forming an equilateral triangle on the axis major, which gives the length of the radius for describing the bottom of the flute.

PLATE XVII.—GRECIAN-IONIC CAPITAL.

Grecian-Ionic Capital.—The drawing marked A, is the elevation of one half of the capital, showing the method of finding the different centres for striking the volutes. The given height of the volute is divided into 7 equal parts: take one part for the diameter of the eye, keeping its centre 4 parts from the top, and 3 from the bottom. The arrangement of the different centres in the eye will be understood by an attentive examination of the drawing, the different radii being shown by dotted lines, marked alphabetically.

The drawing marked B, is the flank elevation of half the capital.

C is the section of the same, showing the barrel of the volute.

D is a transverse section, showing the projection and form of the different members

E, scale for diminishing the listel of the volutes. The base line being divided into 12 equal parts, draw perpendicular lines from each division, making the line *a* equal to the given breadth of the listel; draw the diminishing line from the top of the line *a*, to join the extremity of the base line. The lines are marked alphabetically, corresponding with the different radii to which they apply.

DESIGNS FOR A COTTAGE IN THE GOTHIC STYLE.

PLATE XVIII.

THE six figures on this Plate are plans, elevations, and section, for a Cottage in the *Gothic style*, with a projecting roof, which gives a picturesque appearance to small edifices.

GROUND PLAN, *Figure 1.*—The space marked A, represents the *Parlour*, 15 feet 3 inches by 13 feet; height, 10 feet.

B, *Dining-room*, of the same dimensions as the *Parlour*

C, *Bed-room*, 12 feet 8 inches by 12 feet, and 10 feet high

D, *Kitchen*, 13 feet by 12 feet; height, 10 feet.

E, *Larder*, 6 feet by 5 feet; height, 10 feet.

F, *Water-closet*, 9 feet by 3 feet 8 inches; height, 10 feet.

G, *Lobby* at kitchen door, 5 feet by 4 feet; height, 10 feet.

H, *Entrance-hall*, 9 feet by 6 feet, and 10 feet high.

The *Staircase* is 10 feet 3 inches by 8 feet, lighted from the roof; length of the steps, 3 feet 3 inches; rise, 7 inches; tread, 9 inches.

FRONT ELEVATION, *Figure 2*.—The length is 44 feet 3 inches, including the projections of the back part of the building, which are 13 inches each. The front is divided into two octagonal compartments, each being 11 feet on the side parallel with the front, finished with gable tops; the central part betwixt the octagonal wings is 6 feet long.

The height from the ground to the gable tops on the front is 22 feet 3 inches; and to the ridge of the roof, 24 feet 3 inches; and from the ground to the top of the chimney stalks, 28 feet 10 inches; from the ground to the top of the side walls, 15 feet; and to the under side of the cantalivers on the eaves, 13 feet 3 inches.

The entrance is 3 feet 6 inches wide, raised 12 inches above the level of the ground, ascended by 2 steps; the door is 7 feet 3 inches high to the under side of the transom, between the door and fanlight; the transom is 4 inches thick, and the fanlight 1 foot 4 inches high.

The windows on the ground floor in the central part of the octagonal wings are divided into two compartments, each 1 foot 9 inches wide by 6 feet 8 inches high, crowned with tablets which reach 1 foot 6 inches below the top of the windows; the windows in the diagonal spaces are 2 feet wide in the clear, and 6 feet 8 inches high. The chamber floor windows are 14 feet from the ground; their height is 5 feet; width, 2 feet 6 inches in the clear.

PLAN OF CHAMBER FLOOR, *Figure 3*.—The space on the Plan marked A, represents a *Bed-room*, 13 feet by 11 feet; height of ceiling, 7 feet 10 inches.

B, *Bed-room*, 14 feet by 13 feet; height, 7 feet 10 inches.

C, *Bed-room*, 12 feet 6 inches by 11 feet; height, 7 feet 10 inches.

D, *Bed-room*, 14 feet by 13 feet; and 7 feet 10 inches high.

E, *Closet*, 7 feet 6 inches by 5 feet 3 inches.

F, *Lobby*, 7 feet 10 inches by 4 feet; height, 7 feet 10 inches.

G, *Water-closet*, 5 feet 9 inches by 3 feet 9 inches; height, 7 feet 6 inches; lighted from the roof.

END ELEVATION, *Figure 4*.—The length is 32 feet 2 inches, including the projection to the back, which is 1 foot 4 inches. The octagonal projection to the front is 3 feet 6 inches, and the gable end is 16 feet 3 inches.

The height from the ground to the gable top is 24 feet 3 inches; and from the ground to the ridge of the roof of the back compartment, 20 feet; and to the under side of the cantalivers on the eaves, 8 feet 9 inches.

The windows and other parts of the End Elevation are the same as those described on the Front Elevation.

SECTION, *Figure 5*.—*Ground Floor*.—The section of the ground floor is cut through the centre of the Dining-room B, running in a straight line through the Kitchen D.

The section of the Dining-room B, shows the sleeper joists, foot base, window finishing, plaster cornice, and a section of the chimney-piece. The sleeper joists are 7 inches deep by $2\frac{1}{2}$ inches thick; the foot base is 12 inches high, including the moulding, which is $2\frac{1}{2}$ inches. The window breasts are 2 feet high above the floor; the window architraves are 8 inches broad; the plaster cornice is 5 inches on the walls, and 6 inches on the ceiling; the chimney-piece is 3 feet high in the clear, and 3 feet 11 inches high to the top of the shelf.

The section of the Kitchen D, shows the foot base, window finishing, and plaster cornice. The foot base is 9 inches high; the window breasts are 2 feet high above the floor; the breasts and splays for this window may be finished with plain lining, and the shutters and soffits panelled; the facings are 7 inches broad, moulded on the external edge; the plaster cornice is 4 inches on the walls, and 5 inches on the ceiling.

Chamber Floor.—The section of the chamber floor is taken on a line perpendicular with the section line on the ground floor, cutting through the Bed-rooms A and B. The joists for the chamber floor are 10 inches deep by $2\frac{1}{2}$ inches thick. The foot base in the different rooms is 9 inches high; the window breasts are 2 feet high above the floor; and the chimney-pieces are 2 feet 11 inches high in the clear, and 3 feet 9 inches high to the top of the shelf. The form of the ceilings will be understood by the drawings.

Roof.—The section of the roof shows part of the rafters, ridge boards, cantalivers, and ceiling joists; the rafters are 8 inches deep at the bottom, and 7 inches at the top, by $2\frac{1}{4}$ inches thick; ceiling joists, 6 inches deep by 2 inches thick; ridge boards, 13 inches deep by $1\frac{1}{2}$ inch thick; cantalivers, $4\frac{1}{2}$ inches deep by $2\frac{1}{4}$ inches thick.

PLAN OF ROOF, Figure 6.—The plan of the roof is drawn so as to show it in its finished state. On the platform to the back are shown the roof lights for the staircase and water-closet; the roof light for the staircase is 5 feet long by 3 feet 6 inches wide; and that for the water-closet is 2 feet 3 inches by 1 foot 8 inches.

The water from the back part of the roof may be led to the water-closet cistern, and from the front it may be carried to the drains by cast-iron pipes built into the wall, or by lead pipes on the outside.

DESIGNS FOR A VILLA IN THE GOTHIC STYLE.

PLATES XIX.—XXIV

IN selecting the style of architecture most suitable for Villas, particular attention should be paid to the scenery of the locality in which the edifice is to be erected, as each style of architecture has peculiar charms of its own, the beauties of which will be shown to more advantage when placed in accordance with the characteristic appearance of the site. If the locality be elevated or rocky, it is the best adapted for that description of Gothic which is castellated and of irregular outline. But where the situation is rich and less picturesque, it will harmonize better with the style of Gothic represented in the Plates XIX.—XXIV.

PLATE XIX.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A on the ground Plan, represents the *Drawing-room*, 28 feet 9. inches long by 23 feet wide in the centre, and 19 feet 9 inches wide at each end; height of ceiling, 15 feet 3 inches to the bottom of the panels.

B, *Dining-room*, 22 feet 6 inches by 18 feet, exclusive of the bay, 10 feet by 4 feet; height, 15 feet 3 inches to the bottom of the panels.

C, *Library*, 19 feet 6 inches by 18 feet, exclusive of the bay, 10 feet by 4 feet; height, 15 feet 3 inches.

D, *Ante-room*, 13 feet 3 inches by 12 feet 2 inches; height, 15 feet.

E, *Parlour*, 14 feet 10 inches by 12 feet 2 inches; height, 15 feet.

F, *Steward's-room*, 11 feet by 9 feet; there may be an intersole placed over this and the waiting-room for a store-room.

G, *Waiting-room*, 8 feet by 5 feet 9 inches.

H, *Kitchen*, 19 feet by 13 feet 10 inches; height of ceiling, 12 feet.

K, *Scullery*, 9 feet 9 inches by 8 feet 6 inches; height, 12 feet.

L, *Larder*, 10 feet by 7 feet 9 inches, and 12 feet high.

M, *Water-closet*, 9 feet 4 inches by 6 feet 3 inches; height, 15 feet.

N, *Vestibule*, 10 feet 9 inches square; height, 15 feet in the centre of the groined ceiling, lighted from two small windows or side lights, one on each side of the door, and also by a fanlight over the door.

O, *Passage*, from the Staircase to the Dining-room, 12 feet 9 inches long by 7 feet wide; height of ceiling, 15 feet.

P, *Passage*, from the Staircase to the Library, 15 feet 4 inches long by 7 feet wide; height, 15 feet.

R, *Passage*, communicating with the Kitchen and other back apartments, 29 feet long by 4 feet 9 inches wide, and 12 feet high.

S, *Principal Staircase*, 21 feet by 13 feet; length of the steps, 4 feet 4 inches; rise, nearly $6\frac{1}{2}$ inches; breadth of tread, $11\frac{1}{2}$ inches.

T, *Back Staircase*, 10 feet 4 inches by 7 feet 10 inches; length of the flyers, 3 feet 6 inches; rise, $7\frac{1}{2}$ inches; breadth of tread, $9\frac{3}{4}$ inches. The stair leading to the Cellars and other apartments on the sunk floor, will also be in this staircase.

U, *Porch*, 9 feet 9 inches by 7 feet 3 inches, ascended by 3 steps; length of tread, 6 feet; breadth 12 inches, and rises 6 inches; height, 13 feet 6 inches to the centre of the groined ceiling.

The Porch, Vestibule, Staircases, and Passages, should be paved with stone.

FRONT ELEVATION.—The whole extent of the Front Elevation is 89 feet 6 inches, divided into five compartments. The centre compartment, behind the Porch, is finished with a gable top, terminating with a pinnacle; the height from the ground to the gable top is 39 feet 6 inches, and to the top of the pinnacle 43 feet 6 inches; the breadth of the compartment being 10 feet 6 inches. The compartment on each side of the centre is finished with a gable top, terminating with a pinnacle, and also small octagonal turrets at the angles, supported with corbels, and terminating

in ornamental pinnacles; the height from the ground to the gable top is 42 feet 6 inches, to the top of the pinnacle 46 feet 3 inches, and to the top of the pinnacles on the angles 39 feet; the breadth of each of these compartments is 16 feet 8 inches. The compartment to each end is 34 feet 6 inches high to the top of the battlements, to the top of the turrets on the external angles 34 feet 8 inches, to the gable top 42 feet 6 inches, and to the top of the pinnacles 45 feet 9 inches; the breadth of the end compartments are each 22 feet 10 inches.

The height from the ground to the top of the roof is 14 feet 4 inches, and from the ground to the top of the chimney-stalks 47 feet 9 inches.

The entrance to the Porch is 6 feet wide, and 13 feet 6 inches high from the ground to the top of the soffit of the arch; the height of the Porch, from the ground to the top of the enriched battlements, is 19 feet, and from the ground to the top of the finials, on the octagonal buttresses, 25 feet; its breadth, including the octagonal buttresses, is 12 feet 10 inches. The entrance within the Porch is 4 feet 6 inches wide, raised 2 feet 6 inches above the level of the ground, and ascended by 5 steps, two of which are above the level of the floor in the Porch; the door is 8 feet 3 inches high to the under side of the transom, between the door and fanlight; the transom is 8 inches thick, and the fanlight 1 foot 7 inches high to the top of the soffit of the arch. The side light on each side of the entrance door is 13 inches wide by 7 feet 6 inches high, to the top of the soffit of the arch.

The central windows on the ground floor, on each side of the Porch, are 10 feet high by 6 feet 9 inches wide, each being divided into six compartments by two mullions and a transom $5\frac{1}{2}$ inches thick. The top of each window is crowned with a tablet, which reaches 2 feet 5 inches below the top of the window.

The oriel windows on the ground floor are both of the same dimensions, each being 20 feet 3 inches high from the level of the ground to the top of the battlements; the central part of the window is divided into two compartments, each 2 feet 4 inches wide by 10 feet 8 inches high, to the top of the soffit of the arch; each of the diagonal openings is 1 foot 8 inches wide in the clear of the reveals, and 10 feet 8 inches high to the top of the soffit of the arch.

The oriel window over the Porch, on the chamber floor, is corbeled out from the wall; its height from the ground to the window-sill is 20 feet 6 inches, and from the ground to the top of the battlements, 32 feet 9 inches; the central part of the window is divided into four compartments by a mullion and transom $5\frac{1}{2}$ inches thick, each compartment being 1 foot 7 inches wide, by 4 feet high, from the sill to the under side of the transom, and 3 feet 6 inches from the upper side of the transom to the top of the soffit of the arch; each of the diagonal openings is 10 inches wide in the clear of the reveals, divided by transoms, the same as in the central part.

The other windows on the chamber floor are 20 feet 9 inches from the ground; those in the central part, on each side of the oriel window, are divided into two compartments, each 2 feet wide by 7 feet 10 inches high, crowned with tablets, which reach 1 foot 6 inches below the top of the window.

The window over the oriel window, at each end, is divided into three compartments by mullions 1 foot 2 inches thick; the central division being subdivided by a mullion $5\frac{1}{2}$ inches

thick, into two compartments, each 1 foot 10 inches wide by 7 feet 10 inches high; the side divisions are each 1 foot 2 inches wide by 6 feet 2 inches high. The top of each window is crowned with a tablet, which reaches 1 foot 6 inches below the top of the window.

The windows on the attic floor are 33 feet from the ground; the one over the oriel window is 1 foot 10 inches wide by 3 feet high, to the top of the soffit of the arch. The other two are both of the same dimensions, each being divided into three compartments by mullions 10 inches thick; the centre division is 2 feet wide by 4 feet high, and each of the side divisions is 8 inches wide by 3 feet high. The water tables over these windows reach 8 inches below the top of the window.

PLATE XX.—PLAN OF CHAMBER FLOOR AND BACK ELEVATION.

PLAN OF CHAMBER FLOOR.—The space marked A on the Plan, represents a *Bed-room*, 19 feet 6 inches by 18 feet; height of ceiling, 11 feet 6 inches.

B, *Bed-room*, 15 feet 8 inches by 14 feet; height, 11 feet 6 inches.

C, *Dressing-room*, 12 feet 10 inches, by 11 feet 10 inches, exclusive of the bay, 6 feet 8 inches by 2 feet 10 inches; height, 11 feet 10 inches.

D, *Bed-room*, 15 feet 8 inches by 14 feet 8 inches; height, 11 feet 10 inches; this room may be used as a *Dressing-room* if required.

E, *Bed-room*, 20 feet by 18 feet; height, 11 feet 6 inches.

F, *Bed-room*, 19 feet 9 inches by 16 feet 3 inches; height, 11 feet 6 inches.

G, *Dressing-room*, 13 feet 3 inches by 12 feet; height, 11 feet 6 inches.

H, *Bath-room*, 16 feet by 9 feet, and 11 feet high; the floor of this room is raised $6\frac{1}{2}$ inches above the level of the passage.

K, *Nursery*, 17 feet 8 inches by 12 feet; height of ceiling, 10 feet 10 inches.

L, *Bed-room*, 16 feet 3 inches by 11 feet 8 inches; height, 10 feet 10 inches.

M, *Water-closet*, 9 feet 4 inches by 4 feet 9 inches; height of ceiling, 11 feet 6 inches.

N, *Water-closet*, 4 feet 8 inches by 4 feet; height, 10 feet.

O, *Closet*, 7 feet by 6 feet, and 11 feet 6 inches high.

P, *Passage*, from the Staircase to the *Bed-room* A, 15 feet long by 5 feet wide; height, 11 feet 6 inches.

R, *Passage*, leading from the *Passage* P, 8 feet 6 inches long by 4 feet 8 inches wide; height, 11 feet 6 inches.

S, *Passage*, from the Staircase to the *Bed-room* E, 15 feet 9 inches long by 5 feet wide, and 11 feet 6 inches high.

T, *Passage*, from the back Staircase to the *Passage* S; the length of this passage, from the Staircase to the first archway, is 5 feet; width, 4 feet 2 inches; and the length betwixt the archways is 10 feet 10 inches by 5 feet 10 inches; height, 10 feet 10 inches; this floor is 3 feet 3 inches below the level of the *Passage* S; the length, from the second archway to the *Passage* S; is 13 feet 3 inches by 4 feet 2 inches wide; there are six steps in this part of the passage; rise, $6\frac{1}{2}$ inches; breadth of tread, $9\frac{1}{2}$ inches.

U, *Principal Staircase*, 19 feet 10 inches by 18 feet; height of ceiling, from stair landing

11 feet 6 inches; and the breadth of the stair landing, 6 feet, reached by a flight of 27 steps.

V, *Back Staircase*, 10 feet 4 inches by 8 feet 6 inches; height of ceiling from stair landing, 10 feet 10 inches; breadth of landing, 4 feet.

W, *Stair* leading to the Attic floor, to be carried over the passage T; length of steps, 3 feet 3 inches; breadth, 9 inches; rise, 7 inches; lighted by a roof-light, 4 feet 9 inches long by 2 feet 3 inches wide.

BACK ELEVATION.—The whole extent of the Back Elevation is 89 feet 6 inches.

The wing to the left is 32 feet 6 inches wide, 32 feet 9 inches high from the ground to the top of the battlements, and 41 feet 4 inches high to the ridge of the roof. The windows on the ground floor are 10 feet 3 inches high by 4 feet 9 inches wide, each being divided into four compartments by a mullion and transom, $5\frac{1}{2}$ inches thick. The top of each window is crowned with a tablet, which reaches 2 feet below the top of the window. The windows on the chamber floor are 20 feet 9 inches from the ground, their height is 7 feet, and width 4 feet.

The wing to the right is 30 feet 2 inches wide, and 34 feet 6 inches high from the ground to the gable top; and to the top of the chimney-stalk 40 feet 2 inches; to the top of the side walls 25 feet 3 inches, and to the ridge of the roofs over the windows to the right hand 28 feet 4 inches, and to the left 30 feet. The windows on the ground floor are 7 feet 10 inches high; the one in the centre is 3 feet 9 inches wide; the other two are blank windows, each 2 feet 4 inches wide. The top of each window is crowned with a tablet, which reaches 1 foot 9 inches below the top of the window. The windows on the chamber floor are 17 feet 6 inches from the ground, their height is 6 feet, and the width of the one in the centre is 3 feet 6 inches, the other two being 2 feet 2 inches; these two windows are blank.

The gable top, which stands behind the wing to the right, is 26 feet 9 inches wide, and 41 feet 4 inches high to the top of the roof, and 47 feet 3 inches high from the ground to the top of the chimney-stalks. The recesses, terminating at the top with Gothic arches, are 3 feet high by 6 inches wide.

The central compartment, or staircase, is 13 feet 9 inches wide; and the space which recedes between the staircase and wing to the right is 5 feet wide. The height to the top of the battlements is the same as on the wing to the left. The staircase window is 12 feet 9 inches from the level of the ground, its height being 14 feet 9 inches, width 9 feet 6 inches, divided into six compartments by two mullions 11 inches thick, and transoms $5\frac{1}{2}$ inches thick. The dormer window over the staircase is 4 feet high by 3 feet 2 inches wide, its roof being 6 feet 3 inches above the top of the battlements. The dormer window on the wing to the left is of the same dimensions.

The window on the ground floor, between the staircase and wing to the right, is 8 feet 9 inches high by 2 feet 4 inches wide. The one on the chamber floor is 20 feet 9 inches from the ground; height, 7 feet; width, 2 feet 2 inches. The dormer window over this window is 4 feet high by 2 feet 2 inches wide, and 6 feet from the top of the battlements to the ridge of its roof. The dormer window on the wing to the right is of the same size.

The turrets on the external angles are the same as those described on the Front Elevation.

PLATE XXI.—DETAILS.

THE drawing marked A, is an enlargement of part of the Porch in the Front Elevation. PLATE XIX., showing the form of the mouldings, tracery, and other ornaments. The part of the entrance door shown, gives the form of one of the upper panels; it is divided by a mullion into two compartments, terminating at the top in pointed trefoil arches. It is intended that the recesses in the octagonal turrets be cut through, and also the panels in the enriched battlements.

The drawing marked B, is a portion of the plan of the Porch, showing part of the entrance door, side lights, and inside finishing. The small columns placed in the openings on the flanks, to be finished with bases and capitals to the same height as those in front; the openings to terminate with trefoil arches, surmounted by a main arch and spandrels similar to the front. The cornice and battlements on the flanks to be the same as in front, with the exception of the escutcheon.

The drawing marked C, shows part of the frieze and cornice over the oriel windows on the ground floor. The cusped panels in the frieze are called by the name of quatrefoils.

The drawing marked D, shows part of the frieze and cornice over the oriel window above the Porch. The panels in the frieze are called trefoils.

The drawing marked E, is a section of the cornice, and part of the frieze C. The cornice for D is the same, with the exception of the first member, and the moulding in the panels of the frieze, which is smaller.

PLATE XXII.—PLAN OF ROOF.

IN order to make the drawing as comprehensive as possible, the Plan is arranged in such a manner as to show one half of the roof finished, and the other half in the naked rafters; the space between the rafters is 1 foot 3 inches. The wall plates are 11 inches broad, and $1\frac{1}{2}$ inch thick.

The roofs of the dormer windows are supported by trimmers, properly framed into the rafters; the perpendicular spaces on the front and sides of those windows may be finished with wood, or lath and plaster, with mastic on the outside, so as to correspond with the stone walls.

The form of the chimney-stalks, gutters, and platforms, will be understood by the drawing. The water may be carried from the roof by cast-iron pipes built into the walls.

Great attention should be paid to roofs, in having the gutters and other receptacles for water properly arranged, so that they may not be liable to be choked up, as the comfort and stability of the building depends greatly on the walls being kept dry.

Figure 1 represents the elevation of a part of the roof, on the back wing to the left hand, showing its height from the upper side of the joists of the platform, also the rafters, forming part of the octagonal part of the roof, and likewise the framing of the dormer window; the sill of the dormer window is 1 foot 2 inches broad by 3 inches thick; the upright standards

or jambs in front are 8 inches broad by $3\frac{1}{2}$ inches thick, the lintel 9 inches deep by $4\frac{1}{2}$ inches thick, and the rafters are 5 inches broad by 2 inches thick.

Figure 2 represents the plan of the octagonal part of the roof, showing the method of finding the length of the different rafters, and likewise the different bevels.

A, B, and C, on the Plan, shows the rafters on the central part of the octagon; the line A B being equal to the perpendicular height from the ridge of the roof to the seat of the rafter, and B C equal to the distance from the bottom of the perpendicular line to the extremity of the seat on the wall plate, join A, C; and the line thus joined, is the length from the ridge of the roof to the wall plate. The lines drawn perpendicular from the seat of the jack rafters on the hips, give the length of the different rafters required, and also the bevels at top and bottom for cutting the joints.

B D E, on the Plan, shows the rafters on the diagonal sides of the octagon; the line B D being equal to the perpendicular height of the roof, and B E equal to the distance from the bottom of the perpendicular line to the extremity of the seat on the wall plate, join D E, and we have the length from the ridge to the wall plate. The lines drawn perpendicular from the seat of the jack rafters on the hip and valley rafter, give the different lengths required, and also the bevels at top and bottom for cutting the joints.

F G H, on the Plan, shows the rafters on the square part of the roof, the line F G being equal to the perpendicular height of the roof, and G H equal to the distance from the bottom of the perpendicular line to the extremity of the seat on the wall plate F H, joined, gives the length of the rafters on the square part of the roof; the length of the jack rafters is found by perpendicular lines drawn from the seat on the hip and valley rafter, and also the different bevels required for cutting the joints.

Figure 3 represents the elevation of one half of the octagonal part of the roof, the other half of the drawing shows the form of the couples on the square part of the roof, and also a side view of the framing of the dormer window.

Figure 4 represents the plan of the octagonal part of the roof, and shows the method of finding the lengths of the hip and valley rafters, also the various bevels, and backing of the hips.

A B C, on the Plan, shows one of the rafters on the square part of the roof, with the seat of the sill and lintel of the dormer window marked by dotted lines.

D E F, on the Plan, shows the method of finding the length of the hip rafters on the octagonal part of the roof; draw D E perpendicular to D F, make D E equal to the height of the roof, and then join E F, which gives the length of the hip required.

G H I is the hip rafter on the square part of the roof, the length of it is found by the same rule as the former.

To find the backing of the hips.—From any point in I G, draw *a b* perpendicular to I G, cutting the line at the extremity of the seats of the bottom of the rafters in *a* and *b*; take the point where *a b* cuts I G as the centre; describe a circle so that I H may be a tangent to that circle; from the point where the circle line cuts the line I G in *c*, draw the lines *a c* and *b c*, then *a b c* will be the angle required. The backing of the hip rafter E F is shown on the drawing in the same manner.

The method of finding the side bevels on the different rafters, is shown on the drawing by bevels applied to the various joints.

PLATE XXIII.—SECTION AND DETAILS.

IN order to make the section as easily understood as possible, I shall point out in what direction the section line cuts the various apartments on each floor.

The Sunk Floor.—On the sunk floor it passes through the cellars, in a line perpendicular with the section line on the principal floor; the apartments shown on the section being all dark, can only be used as beer or spirit cellars. The doors are 7 feet 4 inches high by 3 feet wide; the floors are paved with stone; the foot base, door jambs, and soffits are also stone. The form of the brick arches is represented on the drawing.

The Principal Floor.—The section on the principal floor, PLATE XIX., is cut through the centre of the Dining-room B, and Library C, running on a straight line through the room D and E, diverging to the centre of the Vestibule N.

The section of the Dining-room B, shows the sleeper joists, foot base, dado lining, chimney-piece, doors, and window finishing, plaster cornice, and ceiling. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick. The foot base is 1 foot high, including the moulding; the dado lining is 1 foot 10 inches high from the top of the base to the under side of the surbase, and from the floor to the top of the surbase 3 feet 3 inches. The window breasts are 2 feet high above the floor; the shutters show one panel in front, cusped at the top, but the back is divided into four panels by rails dovetailed into the back of the panel. The doors are 8 feet high by 3 feet 10 inches wide, finished with architraves and embattled cornices. The chimney-piece is 3 feet 6 inches wide in the clear, and 5 feet 6 inches wide over the jambs, by 3 feet 6 inches high in the clear, and 4 feet 9 inches high to the top of the shelf. The plaster cornice is 11 inches deep from the under side of the beams; the beams are 1 foot broad, and the panels are $4\frac{1}{2}$ inches sunk.

The section of the Ante-room D, shows the door, foot base, and plaster cornice. The foot base, including the upper fascia, is 1 foot 8 inches high; the door is 8 feet high by 3 feet 8 inches wide. The plaster cornice, including the frieze, is 1 foot 2 inches on the wall, and 8 inches on the ceiling.

The section of the Vestibule N, shows the foot base, entrance to the staircase, groined ceiling, and part of the stair and staircase window. The foot base is 1 foot 6 inches high, including the upper fascia; the foot base in the vestibule, staircase, and passages, should be stone. The entrance to the staircase is 5 feet 6 inches wide, and 11 feet 6 inches high from the floor to the top of the soffit of the arch; the archway is finished with small columns, crowned with ogee canopies, supported on ornamental corbels. The groined ceiling is 15 feet high from the floor to the centre of the arch, and 11 feet 9 inches at the spring.

The section of the Parlour E, shows the foot base, door, and plaster cornice. The foot base, including the upper fascia, is 1 foot 8 inches high; the door is 8 feet high by 3 feet 8 inches wide; the plaster cornice, including the frieze, is 1 foot 6 inches on the wall, and 9 inches on the ceiling.

The section of the Library C, shows the sleeper joists, foot base, section of the chimney-piece, bookcase, door and window finishing, and plaster cornice. The sleeper joists and window finishing are the same as those described for the Dining-room B. The foot base is 10 inches high, including the moulding; the chimney-piece is 3 feet 3 inches high in the clear, and 4 feet 9 inches high to the top of the shelf.

The joists over the Library are 9 inches deep by $2\frac{1}{2}$ inches thick, supported by cast-iron beams $10\frac{1}{2}$ inches deep by $1\frac{3}{4}$ inch thick, with flanges on each side, on which the ceiling joists are hung; the ceiling joists are 5 inches deep by $1\frac{3}{4}$ inch thick. The joists over the Dining-room are 9 inches deep by $2\frac{1}{2}$ inches thick, supported on truss-beams 1 foot deep by 8 inches thick; the ceiling joists are 4 inches deep by $1\frac{3}{4}$ inch thick, hung from the floor joists in a transverse direction. The joists over the other apartments on the principal floor are 11 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The Chamber Floor.—The section of the Chamber floor (see plan in PLATE XX.) is cut in a straight line through the centre of the Bed-rooms A and E.

The sections of the Bed-rooms A and E, show the foot base, door and window finishing, chimney-piece, and plaster cornice. The finishings are of precisely similar dimensions in both Bed-rooms. The foot base is 1 foot 4 inches high, including the upper fascia; the doors are 7 feet 6 inches high by 3 feet 3 inches wide; the window breasts are 2 feet high above the floor; the chimney-piece is 3 feet wide in the clear, and 5 feet wide over the jambs, by 3 feet high in the clear, and 4 feet 4 inches high to the top of the shelf. The plaster cornice in the Bed-room A is 8 inches on the wall, and 4 inches on the ceiling; in the Bed-room B it is 10 inches on the wall, and 5 inches on the ceiling.

The doors, foot base, and other finishing in the three smaller Bed-rooms B, C, D, are all of the same description and similar dimensions. The foot base is 1 foot high, including the moulding; the doors are 7 feet 6 inches high by 3 feet 3 inches wide. The plaster cornice in the room B, is 9 inches on the wall, and 6 inches on the ceiling; in the room C, it is 10 inches on the wall, and 6 inches on the ceiling; and in the room D, it is 11 inches on the wall, and 5 inches on the ceiling.

The joists over the Bed-room floor are each 10 inches deep by $2\frac{1}{2}$ inches thick, and are placed 1 foot $3\frac{1}{2}$ inches apart.

Attic Floor.—The section through the rooms on the Attic floor, and also through the roof, runs on a line perpendicular with the section line on the Chamber floor. The doors, windows, chimney-pieces, and all other finishings in the various rooms shown on the Attic floor, are of the same dimensions. The doors are 6 feet 8 inches high by 2 feet 11 inches wide; the foot base is 8 inches high; the window breasts are 2 feet high above the floor, and the windows are 4 feet high in the clear, by 2 feet 8 inches wide. The chimney-pieces are 3 feet high in the clear, and 3 feet 10 inches high to the top of the shelf, by 2 feet 8 inches wide in the clear, and 4 feet 2 inches wide over the jambs.

The ridge boards shown in the roof are 1 foot deep by $1\frac{1}{2}$ inch thick. The camber or platform joists are 1 foot deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart; the rafters are $9\frac{1}{2}$ inches deep at the bottom, and 8 inches at the top, by $2\frac{1}{4}$ inches thick; the baulks are 6 inches deep by 2 inches thick.

DETAILS.—The drawing marked A, is part of an elevation of the inside of the staircase window on the Elevation, PLATE XX., showing the form of the tracery and finishing. The sash-frame is divided into two compartments by a stile, which forms the top into two trefoil arches; the parts of the mullions which branch off to each side form the compartments between the mullions into quatrefoil arches, being the form of the stone on the outside. The lining of the window jamb is shown by dotted lines.

The drawing marked B, is part of the plan of the window, showing the form of the stone mullions, also the sash-frame and inside mullions; the method of framing the wood finishing will be understood by the drawing, and the different dimensions will be ascertained by the scale.

DESIGN FOR A DOUBLE COTTAGE.

PLATE XXIV.

THIS description of cottage is well suited for families of moderate means, each house containing Kitchen, Dining-room or Parlour, and four Bed-rooms, besides other conveniences. The style of building recommended as best adapted for realizing the effect of this design is neatly built rubble, with all corners, splays, and dressings tooled.

GROUND PLAN.—*Figure 1* is half plan of the ground floor.

A, *The Porch*, 5 feet 3 inches by 2 feet 6 inches.

B, *Entrance-hall and Staircase*, 13 feet 3 inches by 6 feet 6 inches; there is a closet under the upper flight of the stair.

C, *Kitchen*, 12 feet by 11 feet, with concealed bed *a*, 6 feet 6 inches by 4 feet.

D, *Dining-room or Parlour*, 14 feet by 12 feet.

E, *Small Bed-room*, entering from the Dining-room, 8 feet by 6 feet 6 inches.

The height of ceiling of these apartments is 10 feet. The sills of the windows are 2 feet from the floor, the height of windows themselves being 6 feet.

The Offices behind consist of Passages *b b*.

c, *Washing-house and Scullery*, 8 feet by 7 feet 3 inches.

d, *Larder*, 4 feet 6 inches by 2 feet 9 inches.

e, *Coal-cellar*, 4 feet 6 inches by 4 feet.

f, *Ash-pit*, 4 feet 9 inches by 4 feet 6 inches.

g, *Privy*, 4 feet 6 inches by 2 feet 9 inches.

h, *Open court*, 12 feet by 8 feet 6 inches.

BED-ROOM FLOOR.—*Figure 2* is half plan of the Bed-room floor.

B, *Continuation of Staircase*.

F, *Bed-room*, 12 feet by 10 feet.

G, *Bed-room*, 12 feet by 10 feet.

H, *Bed-room*, 11 feet by 9 feet 6 inches.

I, *Napery closet*, 6 feet 6 inches by 3 feet.

The wall head is 5 feet above the level of the floor, and the height of ceiling in the centre of the rooms is 9 feet 6 inches. The window sills are 2 feet above the floor.

FRONT ELEVATION, *Figure 3*.—This elevation is 56 feet in length.

It will be seen that the roofs of the Porches are continued across the centre compartment, which produces a pleasing variety in the design, and affords a covered seat to each house between the porch and dwarf wall separating the two dwellings. Between the verandah and wall head, the staircase lights are introduced, each consisting of five square lights in a range.

END ELEVATION, *Figure 4*.—It will be observed in this elevation, that the gable is marked off by a recess formed in the thickness of the wall on one side, which has the effect of balancing the design. On the one side of the main building is the end elevation of the offices, and on the other, the wall projected from the centre of the verandah.

BACK ELEVATION, *Figure 5*.—Back elevation, including that of the offices. In this design the principal feature is a gable, which marks the centre.

DESIGNS FOR A VILLA IN THE ITALIAN STYLE.

PLATES XXV.—XXVIII.

VILLAS of this kind are best adapted for suburban situations, where the surrounding scenery, being generally highly cultivated, is rendered tamer and less picturesque than in the more rural districts.

PLATE XXV.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A represents the *Drawing-room*, 19 feet 9 inches long by 17 feet wide, exclusive of the bay, 11 feet 4 inches by 3 feet 9 inches; height of ceiling, 14 feet.

B, *Parlour*, 15 feet 3 inches by 14 feet 8 inches; height, 14 feet.

C, *Dining-room*, 19 feet 6 inches by 16 feet; height, 14 feet.

D, *Kitchen*, 16 feet by 15 feet; height of ceiling, 13 feet.

E, *Scullery*, 11 feet by 8 feet; height, 13 feet.

F, *Servant's Bed-room*, 11 feet by 7 feet 9 inches, and 13 feet high.

G, *Larder*, 10 feet by 5 feet 6 inches; height of ceiling, 14 feet.

H, *Water-closet and Bath-room*, 10 feet by 6 feet; height, 14 feet.

I, *Vestibule*, 15 feet 10 inches by 7 feet 9 inches; height to centre of groined ceiling, 14 feet.

L, *Passage* from the Kitchen door to the staircase, 10 feet long by 4 feet 8 inches wide, and 14 feet high.

M, *Staircase*, 17 feet by 11 feet 4 inches; height from floor to the ceiling of stair landing, 14 feet 3 inches; length of steps, 4 feet; rise, nearly $6\frac{1}{4}$ inches; breadth of tread, 10 inches.

N, *Entrance-hall*, 8 feet by 6 feet 4 inches; height of ceiling, 13 feet.

O, *Green-house*, 30 feet 6 inches long by 11 feet 9 inches wide.

FRONT ELEVATION.—The whole extent of the front, including the wing to the right, is 66 feet 4 inches; the wing which is to the back projects 12 feet 2 inches beyond the extremity of the principal part of the building; the height of the wing, from the ground to the top of the cornice, is 14 feet 10 inches, and to the top of the roof, 21 feet.

The front of the building is divided into three compartments; that to the right is 18 feet 9 inches; the centre is 19 feet 9 inches, and the compartment to the left, including the oriel window, is 15 feet 8 inches; the height from the ground to the top of the cornice, is 29 feet 8 inches; to the top of the roof, 34 feet 10 inches; and from the surface of the ground to the chimney tops, 40 feet.

The entrance is 4 feet 3 inches wide, raised 1 foot 6 inches above the level of the ground, ascended by three steps, one of which is in the doorway; the height of the doorway, from the top of the steps to the under side of the soffit of the arch, is 10 feet 8 inches; the door is 7 feet 9 inches high to the under side of the transom below the fanlight, the transom being 7 inches thick.

The length of the porch in front is 10 feet; height to the top of the cornice, 15 feet 8 inches, and from the ground to the top of the railing, 18 feet 9½ inches.

The window on the ground floor in the central compartment is 9 feet high in the clear, by 6 feet 8 inches wide, divided into three compartments by stone mullions, 7 inches thick; the height from the ground to the top of the entablature over this window is 15 feet 6 inches.

The window on the ground floor, on the compartment to the right, is 9 feet high in the clear, by 6 feet 8 inches wide, divided into three compartments by stone mullions, 8 inches thick; the height from the ground to the top of the entablature over this window is 15 feet.

The window in the wing is divided into two compartments by a stone mullion, 7 inches thick; each compartment is 1 foot 8½ inches wide by 7 feet 9 inches high to the top of the soffit of the arch.

The windows on the chamber floor are 18 feet 3 inches from the ground; the one over the porch is divided into two compartments by a stone mullion, 7 inches thick; each compartment is 1 foot 9 inches wide by 7 feet 3 inches high; the other two are each divided into three compartments by stone mullions, 7 inches thick; each compartment being 1 foot 9 inches wide by 7 feet 3 inches high.

PLATE XXVI.—CHAMBER FLOOR AND FLANK ELEVATION.

CHAMBER FLOOR.—The space marked A on the chamber floor plan, represents a *Bed-room*, 19 feet 6 inches by 16 feet; height of ceiling, 12 feet 6 inches.

B, *Bed-room*, 15 feet 4 inches by 13 feet 3 inches; height, 12 feet 6 inches.

C, *Dressing-room*, 10 feet 10 inches by 8 feet 8 inches; height, 12 feet 6 inches.

D, *Bed-room*, 17 feet by 12 feet 6 inches; height, 12 feet 6 inches.

E, *Dressing-room*, 12 feet 4 inches by 7 feet 9 inches; height, 12 feet 6 inches.

F, *Bed-room*, 12 feet 6 inches by 10 feet 6 inches, and 12 feet 6 inches high.

G, *Water-closet*, 5 feet 8 inches by 5 feet; height of ceiling, 10 feet 6 inches.

H, *Passage* between the staircase and water-closet, 5 feet 3 inches long by 5 feet wide; height, 12 feet 6 inches.

K, *Passage* from the staircase to the Bed-room D, 8 feet 4 inches long by 5 feet wide; height, 12 feet 6 inches.

L, *Passage* leading from the staircase to the Bed-room B, 8 feet 8 inches long by 4 feet 6 inches wide, and 12 feet 6 inches high, lighted from the roof.

M, *Staircase*, 17 feet 8 inches by 11 feet 4 inches; height, from the stair landing to the panels of ceiling, 13 feet 4 inches.

FLANK ELEVATION.—The whole extent of the Flank Elevation, including the back wing, is 63 feet 4 inches; the back wing extends 17 feet 8 inches.

The green-house, which stands in front of this wing, is 12 feet 9 inches wide by 15 feet 8 inches high, from the level of the ground to the top of the entablature, and 18 feet 9½ inches high to the top of the railing.

The principal part of the building on this flank is divided into two compartments; that to the right is 24 feet 3 inches, including the projection of the front window; and the compartment to the left is 21 feet 5 inches.

The oriel window on the ground floor is 15 feet 8 inches high from the level of the ground to the top of the entablature, and 18 feet 9½ inches high to the top of the railing. The central part of the window is divided into three compartments, by stone mullions, 6 inches thick, each compartment being 1 foot 9 inches wide by 9 feet 6 inches high; the dimensions of each of the diagonal openings are 1 foot 8 inches wide in the clear of the reveals, and 9 feet 6 inches high.

The porch is the same height from the level of the ground to the top of the entablature and railing as the oriel window on the ground floor, both being equal heights with the green-house; the window in the porch is 9 feet 2 inches high, from the sill to the top of the soffit of the arch, by 4 feet wide; it is divided into two compartments by a stone mullion, 7 inches thick; the mullion and jambs finish with capitals at the spring of the arch; the top of the window is filled in with tracery, forming semicircular arches over each compartment.

The window on the ground floor to the right is divided into two compartments by a stone mullion, 8 inches thick; each compartment being 9 feet high by 1 foot 11 inches wide.

The windows on the chamber floor are 18 feet 3 inches from the ground; the one over the oriel window is divided into three compartments by stone mullions, 7 inches thick; each compartment is 1 foot 9 inches wide by 7 feet 3 inches high; the other two are each divided into two compartments by a stone mullion, 7 inches thick; the compartments being each 1 foot 9 inches wide by 7 feet 3 inches high.

The entrance to the green-house is 3 feet 3 inches wide, raised 1 foot above the level of the ground, ascended by two steps; the doorway is 11 feet 6 inches high, from the level of the floor to the top of the soffit of the arch; the door is 7 feet high, made to correspond with the sash-frames, and shut against the counter-check, the upper sash being fixed; the window on each side of the door is 8 feet 9 inches high by 1 foot 10 inches wide.

The cornice and other ornamental parts are detailed in PLATE XXVIII

PLATE XXVII.—SECTION AND PLAN OF ROOF.

SECTION.—The section of the ground floor is cut in a transverse direction through the centre of the Parlour B, and Vestibule I, diverging from the straight line so as to cut through the first flight of steps in the stair, the staircase window, and green-house.

The walls are sunk to a depth sufficient for some situations, but in others they may require to be deeper before a proper foundation be obtained, so as to insure the stability of the superstructure.

The section of the Parlour B, shows the sleeper joists, foot base, chimney-piece, doors, window finishing, and plaster cornice. The sleeper joists are 8 inches deep by $2\frac{1}{4}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base, including the upper fascia, is 1 foot 2 inches high. The chimney-piece is 3 feet wide in the clear, and 4 feet 9 inches wide over the jambs, by 3 feet high in the clear, and 4 feet 2 inches high to the top of the shelf; the pediment over the shelf, being 6 inches high at the centre. The press doors shown on the section are 7 feet 10 inches high by 3 feet wide. The window breasts are 1 foot 10 inches high above the floor. The plaster cornice, including the frieze, is 1 foot 2 inches on the wall, and 7 inches on the ceiling.

The section through the Vestibule I, shows the foot base, Dining-room door, and groined ceiling. The foot base in the vestibule, entrance hall, and staircase, should be stone; its height, including the moulding, is 1 foot. The door is 7 feet 10 inches high by 3 feet 9 inches wide, recessed 1 foot into the wall; the door is finished with architraves and cornice, and the recess with pilasters supporting an elliptical archivault. The groined ceiling is 12 feet high from the floor to the spring of the ribs, and 14 feet high to the centre of the arch.

The section of the staircase shows the stair, doors, window finishing, and ceiling. The section cut through the first flight of steps and resting-place, shows the form of the joists and nosings of the steps; and the elevation of the second flight represents the end of the steps, also the hand rail and plaster moulding on the wall under the stair and landing-place; the joists of the landing-place are 6 inches deep by $2\frac{1}{4}$ inches thick, supported by a beam 1 foot deep by 6 inches thick. The door under the first resting-place of the stair is 7 feet 6 inches high by 3 feet 6 inches wide; the other door on the principal floor is 7 feet 10 inches high by 3 feet 3 inches wide; and the door shown through the archway on the stair landing is 7 feet 6 inches high by 3 feet 2 inches wide; the archway being 9 feet 10 inches high, from the floor to the top of the soffit of the arch, by 4 feet 3 inches wide. The staircase window is divided into four compartments by a mullion and transom, 9 inches thick; the height, from the sill to the under side of the transom, is 4 feet 9 inches, and from the upper side of the transom to the lintel, 8 feet 2 inches; the width of each compartment being 2 feet 6 inches; that part of the window below the transom is lighted from the green-house. The ceiling is divided into three panels, so as the centre panel forms a square of 5 feet 4 inches; they are sunk 5 inches; breadth of stiles, 12 inches; in the centre panel there is a pendant; 3 feet in diameter at the top, by 2 feet 2 inches deep; the height, from the under side of the frieze to the upper side of the cornice, is 1 foot 4 inches, and from the upper side of the cornice to the line of the bottom of the panels, there is a cove 11 inches high.

The section of the green-house shows the height of the back and front wall, foot base, and

also the pitch of the roof. The floor of the green-house is sunk 6 inches below the level of the adjoining floors. The foot base is 1 foot high; the floor and base of the green-house should be stone. The height of the back wall, from the floor to the under side of the beam for supporting the rafters, is 15 feet 9 inches; and the height of the front wall, from the floor to the under side of the bottom of the rafters, is 9 feet. The height, from the floor to the sill of the staircase window, is 10 feet 10 inches; and from the floor to the sill of the sashes in the front wall, 1 foot 11 inches; the height of the sashes is 5 feet 6 inches in the clear, by 2 feet 9 inches wide betwixt the mullions. The cornice on the front wall forms the gutter; it may either be made of cast-iron, or wood covered with lead; the pipes for conducting the rain water from the roof may be taken to the inside of the wall, and shut in with the wood finishing.

Chamber Floor.—The section of the Chamber floor (see plan, PLATE XXVI.) is cut through the Bed-room B, and Dressing-room C, on a line perpendicular with the section line on the ground floor. The chamber floor joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The section of the Bed-room B, shows the foot base, door and window finishing, chimney-piece, and plaster cornice. The foot base, including the upper fascia, is 1 foot 1 inch high. The press door shown on the section is 7 feet 6 inches high by 3 feet wide; the room doors being 3 feet 3 inches wide. The window breast is 2 feet high above the floor. The chimney-piece is 3 feet wide in the clear, and 4 feet 4 inches wide over the jambs, by 3 feet high in the clear, and 4 feet 2 inches high to the top of the shelf. The plaster cornice, including the frieze, is 11 inches on the wall, and 6 inches on the ceiling.

The section of the Dressing-room shows the foot base and plaster cornice. The foot base is 11 inches high; and the plaster cornice is 8 inches high on the wall by 5 inches on the ceiling.

Roof.—The section of the Roof (PLATE XXVII.) is on a line perpendicular with the other section lines. The ridge boards are 1 foot deep by $1\frac{1}{2}$ inch thick. The platform joists are 10 inches deep by $2\frac{1}{4}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart; rafters, $7\frac{1}{2}$ inches deep at the bottom, and 6 inches at the top by 2 inches thick; baulks, 5 inches deep by $1\frac{1}{4}$ inch thick; ceiling joists, $7\frac{1}{2}$ inches deep by 2 inches thick. The ceiling joists over the staircase are kept 1 foot from the bottom of the rafters, in order to give greater height of ceiling.

PLAN OF ROOF.—The plan of the Roof is drawn so as to represent the one half finished and the other half in the naked rafters; the space between the rafters is 1 foot $3\frac{1}{2}$ inches. The wall plates are 11 inches broad by $1\frac{1}{2}$ inch thick; they should be half checked at the angles and other joinings, and properly bedded with lime.

The roof light, over the Passage L, on the chamber floor, is 3 feet 2 inches by 1 foot 10 inches.

The gutters are formed in the top of the stone cornice, and covered with lead carried up below the slates to a height sufficient to prevent the water from getting into the walls.

The water may be carried from the roof by cast-iron pipes built into the wall, or by lead pipes on the outside.

The roof of the green-house is shown on the drawing in the naked rafters, and on the Chamber floor plan, PLATE XXVI., in its finished state.

PLATE XXVIII—DETAILS.

The drawing marked A, represents the base moulding and part of the rusticated quoins.

The drawing marked B, shows part of the cornice and pediment, also a front and side of the consoles, and part of the rusticated quoins. The method of raking mouldings is shown on the upper moulding of the cornice. When a building has a horizontal cornice crowning the walls, and a pediment with a similar cornice upon the rake, the upper mouldings are mitred together, so that the mitre plane may be perpendicular to the horizon; this renders the sections of the upper member of the pediment, and that of the horizontal cornice dissimilar in their right section. In that case, the one must be given in order to find the other. Supposing that the section of the upper moulding of the horizontal cornice be drawn to the true proportion; then from it, as shown on the drawing, find the section of the upper member of the pediment. Let a, b, c, d, e, f, g, be the number of points given on the horizontal section; draw lines through these points, parallel to the rake; and also, draw lines through the same points, perpendicular to the horizontal cornice, so that all shall cut any horizontal line in the points h, i, j, k, l, m, n. Transfer the distance between the points h, i, j, k, l, m, n, to any place upon the raking line, as h', i', j', k', l', m', n'; and from these points draw lines perpendicular to the rake, cutting the inclined lines at the points a', b', c', d', e', f', g'; then through these points draw a curve, which will be the section of the inclined moulding. Again, suppose it were required to return the moulding upon the rake to a level moulding at the top; upon any horizontal line, transfer the distance between the points h, i, j, k, l, m, n, to h'', i'', j'', k'', l'', m'', n''; and from these points draw lines perpendicular to the level cornice, cutting the raking lines at the points a'', b'', c'', d'', e'', f'', g''; then through the points draw a curve, which will form the return moulding at the top.

The drawing marked C, shows the capital of one of the pilasters on the porch and greenhouse; also part of the entablature and parapet.

The drawing marked D, is a front view of one of the trusses for one of the windows in the Front Elevation, PLATE XXV.; and the drawing marked E, is a profile of the same.

The drawing marked F, is part of the base of one of the chimney-stalks; and the drawing marked G, is the entablature and blocking.

The drawing marked H, is one of the wreaths on the frieze below the pediment on the Front Elevation, PLATE XXV.

DESIGNS FOR A DOUBLE COTTAGE.

PLATE XXIX.

PRINCIPAL ELEVATION, *Figure 1*.—The whole extent of the Front Elevation, including both cottages, is 82 feet 8 inches; the height, from the level of the ground to the eaves of the

roof is 12 feet 10 inches; to the top of the roof, 22 feet 10 inches; and from the ground to the top of the chimney-stalks, 27 feet 3 inches. The height, from the level of the ground to the tops of the roofs over the dormer windows in front, is 20 feet 9 inches.

The height of those on the end elevation is 21 feet 9 inches; and the height from the ground to the top of the chimney-stalk over the dormer windows, is 26 feet.

The entrance doors are each 3 feet 8 inches wide, raised 1 foot 1 inch above the level of the ground, ascended by two steps in the doorway; the doors are each 7 feet high to the under side of the transom, between the door and fanlight; the transom being 4 inches thick, and the fanlight 1 foot high.

The oriel windows are both of the same dimensions, each being 11 feet from the ground to the top of the cornice, and 12 feet to the top of the roof; the central compartment of the oriel windows is 3 feet 9 inches wide by 6 feet 6 inches high; and the diagonal openings are each 1 foot 2 inches wide by 6 feet 6 inches high in the clear.

The other windows on the ground floor are each 3 feet 9 inches wide by 6 feet 6 inches high.

The niche in the centre of the building is 2 feet 9 inches wide by 6 feet 6 inches high to the top of the soffit of the arch.

The chamber floor windows are 13 feet 9 inches from the ground; the width of each window is 3 feet by 4 feet 3 inches high in the clear.

PLAN OF CHAMBER FLOOR.—*Figure 2* is the plan of the Chamber floor for one of the houses; the other being of similar dimensions, the same drawing will suffice for both.

The space marked A on the Plan, represents a *Bed-room*, 14 feet by 13 feet; height of ceiling, 7 feet 9 inches in the centre.

B, *Bed-room*, 15 feet by 13 feet, exclusive of the recess for a bed, 6 feet 6 inches by 4 feet 3 inches; height, 7 feet 9 inches.

C, *Bed-room*, 13 feet 3 inches by 10 feet 6 inches, exclusive of the recess for a bed, 6 feet 6 inches by 4 feet 3 inches; height, 7 feet 9 inches.

D, *Bed-room*, 11 feet by 10 feet 8 inches, and 7 feet 9 inches high to the horizontal portion of the ceiling.

E, *Store-room*, 9 feet 6 inches by 9 feet; height of ceiling, 7 feet in the centre. The entrance to the store-room is from the scullery by a hatch, shown on the floor by dotted lines.

F, *Water-closet*, 5 feet 9 inches by 4 feet 3 inches; height, 7 feet 3 inches.

G, *Pantry*, 3 feet 9 inches by 1 foot 9 inches.

H, *Stair-landing*, 12 feet long by 7 feet 2 inches wide at the centre, and 3 feet 6 inches wide at each end of the space; lighted from the roof.

PLAN OF ROOF.—*Figure 3* is the plan of the Roof for one half of the building, the other half being the same form and size. The roof light over the stair-landing is 3 feet 9 inches by 3 feet, and the roof light over the water-closet is 3 feet 7 inches by 2 feet. The dimensions of the different portions of the roof may be ascertained by reference to the scale.

GROUND PLAN.—*Figure 4* is the Ground Plan of the whole building, but as the size and arrangement of both houses is the same, a description of one will be sufficient.

The space marked A on the Plan, represents the *Dining-room*, 15 feet 10 inches by 14 feet 4 inches, exclusive of the bay, 8 feet 3 inches by 3 feet; height of ceiling, 9 feet 8 inches.

B, *Parlour*, 14 feet by 12 feet 9 inches; height, 9 feet 8 inches.

C, *Bed-room*, 12 feet by 10 feet 9 inches; height, 9 feet 8 inches.

D, *Kitchen*, 13 feet 10 inches by 12 feet, and 9 feet 8 inches high.

E, *Scullery*, 8 feet 10 inches by 7 feet 10 inches; height of ceiling, 8 feet 9 inches.

F, *Pantry*, 4 feet 4 inches by 4 feet; height, 8 feet 9 inches.

G, *Water-closet*, 6 feet by 4 feet 2 inches; height, 9 feet 8 inches.

H, *Entrance-hall*, 12 feet 4 inches by 6 feet 8 inches; height, 9 feet 8 inches.

I, *Passage*, 12 feet long by 4 feet 8 inches wide at the centre, and 4 feet 2 inches wide at each end, and 9 feet 8 inches high. The stair is 3 feet 4 inches wide; height of steps, 7 inches; breadth of tread, $9\frac{1}{2}$ inches.

L, *Passage* between the kitchen and scullery, 5 feet long by 4 feet 3 inches wide, and 8 feet 9 inches high.

DESIGNS FOR A VILLA AFTER THE GRECIAN DORIC STYLE.

PLATES XXX.—XXXIII.

THE Grecian Doric, when judiciously applied, gives a chaste and graceful appearance, even to small buildings, although the noble grandeur and majestic dignity of the order can only be fully developed in large buildings, of which we have many magnificent examples, both ancient and modern. As the predominating beauty of Grecian architecture is displayed in its combination of elegance with uniform simplicity, it should always be borne in mind that villas, or other buildings after that style, should exhibit that regularity of elevation, and harmony of outline, characteristic of Grecian architecture.

PLATE XXX.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A on the Ground Plan, represents the *Drawing-room*, 18 feet 3 inches by 16 feet, exclusive of the bay, 9 feet 10 inches by 3 feet 3 inches; height of ceiling, 12 feet 9 inches.

B, *Dining-room*, 16 feet by 15 feet 10 inches; height, 12 feet 9 inches; the doorway between the Dining-room and Drawing-room is 7 feet wide; the doors run back into the partition, so that both rooms may be united when required.

C, *Parlour*, 16 feet by 15 feet; height, 12 feet 9 inches.

D, *Bed-room*, 12 feet 3 inches by 10 feet 4 inches, exclusive of a concealed bed, 6 feet 6 inches by 4 feet; height of ceiling, 12 feet 9 inches.

E, *Kitchen*, 14 feet by 12 feet; height of ceiling, 10 feet 4 inches.

F, *Scullevy*, 12 feet by 7 feet 6 inches; height, 10 feet 4 inches.

G, *Larder*, 7 feet 6 inches by 5 feet 2 inches; height, 10 feet 4 inches.

H, *Laundry*, 13 feet 4 inches by 12 feet; height, 10 feet 4 inches.

I, *Washing-house*, 13 feet 4 inches by 12 feet; height, 10 feet 4 inches.

K, *Store-room*, 6 feet 8 inches by four feet 6 inches, and 10 feet 4 inches high.

L, *Bath-room*, 7 feet 10 inches by 7 feet 9 inches; height of ceiling, 12 feet 9 inches.

M, *Water-closet*, 5 feet by 3 feet 8 inches, and 11 feet high.

N, *Pantry*, 5 feet 4 inches by 4 feet; height of ceiling, 12 feet 9 inches.

O, *Staircase*, 14 feet 6 inches by 12 feet; height from floor to the ceiling of stair-landing, 12 feet 9 inches; length of steps, 4 feet; rise, nearly $6\frac{3}{8}$ inches; breadth of tread, $9\frac{1}{2}$ inches.

P, *Vestibule*, 8 feet 6 inches square, and 12 feet 9 inches high.

R, *Entrance-hall*, 8 feet 6 inches by 5 feet; height, 12 feet 9 inches; the hall is lighted partly from a fanlight over the entrance door, and partly from the staircase by a sash door and side lights between the hall and vestibule.

S, *Passage*, communicating with the kitchen door and staircase, 26 feet 9 inches long by 4 feet 9 inches wide, and 12 feet 9 inches high from the staircase to the archway through the stone wall, the remainder being 10 feet 4 inches high, lighted from a fanlight over the kitchen door.

The *Lobby* between the laundry and washing-house is 5 feet 4 inches by 4 feet 6 inches, and 10 feet 4 inches high. The Lobby between the staircase and water-closet is 4 feet 6 inches by 3 feet 2 inches, and 12 feet 9 inches high.

FRONT ELEVATION.—The whole extent of the Front, from the extremity of one wing to that of the other, is 74 feet 4 inches; extent of each of the wings, 14 feet 5 inches, and the body of the building 45 feet 6 inches. The wings recede 2 feet 2 inches back from the front of the principal part of the building.

The height of the wings, from the level of the ground to the top of the parapet, is 18 feet; and to the top of the entablature, 15 feet; the height of the entablature being 2 feet 6 inches. The blank windows in the wings are 7 feet 2 inches high, and 4 feet wide. The architraves round these windows are $10\frac{1}{2}$ inches at the bottom, and $8\frac{1}{2}$ inches at the top, with a break at top of 2 inches. The entablature, and also the mouldings of the caps of the pilasters, are similar to those of the Choragic monument of Trysallus, with the exception of the antique wreaths in the frieze, which are omitted.

The height, from the level of the ground to the top of the cornice over the principal part of the building, is 27 feet 9 inches; to the top of the parapet, 30 feet 5 inches; to the top of the blocking over the central compartment, 32 feet 2 inches; to the top of the roof, 33 feet; and from the level of the ground to the top of the chimney-stalks, 34 feet.

The entrance is 4 feet wide, raised upon three steps, of 6 inches rise, on the top of which are two Doric columns, with pilasters behind them. The columns are 6 diameters high; the entablature 3 feet 4 inches, and the blocking-course, 9 inches. The entrance-door is 7 feet 9 inches high to the under side of the transom, between the door and fanlight; the transom being 5 inches thick, and the fanlight 1 foot 9 inches high.

The window on each side of the porch, in the centre part of the building, is 3 feet 8 inches from the ground; 8 feet 2 inches high, and 4 feet wide. The architraves round these windows are 11 inches at the bottom, and 9 inches at the top. The ears at the top of the window are vertical with the bottom of the architrave. That part of the architrave which extends across the top of the window is 9 inches broad. Over the architrave is a cornice and pediment, with an ornament at each corner.

The chamber floor windows are 17 feet 6 inches from the ground; their height is 7 feet 6 inches; width, 4 feet; with architraves similar to those on the ground floor.

PLATE XXXI.—CHAMBER FLOOR AND END ELEVATION.

CHAMBER FLOOR.—The space marked A on the Plan, represents a *Bed-room*, 15 feet 6 inches by 14 feet 10 inches; height of ceiling, 11 feet 10 inches.

B, *Dressing-room*, 11 feet by 8 feet 6 inches; height, 11 feet 10 inches.

C, *Bed-room*, 15 feet by 14 feet 10 inches; height, 11 feet 10 inches.

D, *Dressing-room*, or small *Bed-room*, 11 feet 10 inches by 10 feet 6 inches; height, 11 feet 10 inches.

E, *Bed-room*, 13 feet 6 inches by 12 feet 2 inches; height, 11 feet 10 inches.

F, *Dressing-room*, 12 feet 4 inches by 7 feet; height, 11 feet 10 inches.

G, *Bed-room*, 10 feet 10 inches by 10 feet 4 inches; height, 11 feet 10 inches.

H, *Water-closet*, 5 feet 9 inches by 4 feet 6 inches; height, 11 feet.

K, *Closet*, 7 feet by 5 feet 4 inches; height, 11 feet.

L, *Closet*, 6 feet by 3 feet 3 inches, and 11 feet high.

M, *Staircase*, 14 feet 6 inches by 12 feet; height, from the stair-landing to the bottom of lantern, 14 feet 9 inches.

N, *Passage* leading from the staircase to the Bed-rooms C and E, 5 feet 3 inches by 4 feet 9 inches, and 11 feet 10 inches high.

O, *Passage* leading from the staircase to the water-closet, 13 feet 2 inches long by 4 feet 9 inches wide, and 11 feet 10 inches high; lighted from the roof, as shown on the plan by dotted lines.

P, *Passage* from the staircase to the Bed-room D, 4 feet 2 inches by 3 feet 3 inches; height of ceiling, 11 feet 10 inches.

END ELEVATION.—The extent of the End Elevation, exclusive of the Porch, is 42 feet 8 inches, the porch projecting 3 feet 9 inches at the bottom of the columns. The extent of the wing is 36 feet; the different heights being similar to those described on the Front Elevation.

The entrance is 3 feet 10 inches wide, raised 1 foot 6 inches above the level of the ground, ascended by 3 steps in the doorway; the door is 7 feet 4 inches high to the under side of the transom, between the door and fanlight; the transom being 4 inches thick, and the fanlight 1 foot 6 inches high.

The Venetian window on each side of the doorway is 6 feet 10 inches high; the centre compartment is 3 feet 8 inches wide; and each of the side compartments 1 foot 2 inches.

The windows on the chamber floor are 17 feet 6 inches from the ground; their height is 7 feet 6 inches; width, 3 feet 10 inches.

The different heights on the End Elevation are similar to those described on the Front Elevation.

PLATE XXXII.—SECTION AND DETAILS.

SECTION, *Ground Floor*.—The section of the *Ground Floor* is cut through the centre of the Passage S, running in a straight line through the Staircase, Drawing-room A, Store-room K, and lobby between the laundry and washing-house; and the section of the sunk floor is cut on a line perpendicular with the section line on the ground floor, showing part of the cellars, and also the stair leading to the principal staircase.

The height of the cellars at the centre of the arch is 8 feet 2 inches, and at the spring of the arch, 7 feet 4 inches. The cellar doors are 7 feet high by 3 feet 2 inches wide. The stair is 3 feet 10 inches wide; height of steps, $7\frac{1}{8}$ inches; breadth of tread, 9 inches. The floors and foot base in the cellars and staircase should be stone; the height of the foot base is 7 inches.

The depth of the foundation walls, and the arrangement of the drains, depend wholly on the nature of the situation.

The section of the Drawing-room A, on the ground floor, shows the sleeper joists, foot base, chimney-piece, doors, window finishing, and plaster cornice. The sleeper joists are 7 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base, including the upper fascia, is 1 foot 5 inches high. The chimney-piece is 3 feet 2 inches high in the clear, and 4 feet 4 inches high to the top of the shelf. The doors are 7 feet 10 inches high in the clear, and 9 feet 6 inches high to the top of the cornice over the architraves. The oriel window is finished with pilasters and trusses, supporting a frieze and cornice; the pilasters are 10 inches broad, and the frieze and cornice 1 foot 3 inches high; the window breast is 1 foot 10 inches high above the floor; and the plaster cornice is 11 inches on the wall by 9 inches on the ceiling.

The floors and foot base in the Store-room K, and lobby between the laundry and washing-house, are stone; the height of the foot base is 7 inches. The doors are 7 feet 2 inches high; the laundry door is 3 feet 4 inches wide, and the store-room door, 3 feet. The plaster cornice in the lobby is 4 inches on the wall, and 5 inches on the ceiling. The floor foot base and doors in the Passage S, are the same as described in the lobby between the laundry and washing-house.

The plaster cornice in the compartment between the staircase and archway, is 8 inches on the wall by 7 inches on the ceiling; and in the compartment between the archway and kitchen door, it is 6 inches on the wall by 5 inches on the ceiling. The archway is 9 feet 6 inches high from the floor to the top of the soffit of the arch.

The section of the staircase shows the stair, doors, stair-landing, plaster cornice, ceiling, and lantern light. The doors leading to the Drawing-room and passage are 7 feet 10 inches high, and the door under the stair leading to the water-closet is 7 feet high by 3 feet wide. The joists in the stair-landing are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The

plaster cornice, including the frieze, is 1 foot 7 inches high; projection of cornice from the wall, $6\frac{1}{2}$ inches. The height of the coved ceiling, from the top of the cornice to the under side of the beams forming the lantern, is 1 foot 2 inches; height, from the bottom of the beams to the sill of glass frame, 1 foot 5 inches.

Chamber Floor.—The section of the Chamber floor is cut through the Dressing-room B, and Closet K, on a line perpendicular with the section line on the ground floor. The chamber floor joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The section of the Dressing-room B, shows the foot base, door, window finishing, and plaster cornice; the foot base is 11 inches high; the door is 7 feet 6 inches high by 3 feet 2 inches wide; the window breast is 2 feet high above the floor; and the plaster cornice is 7 inches on the wall by 6 inches on the ceiling. The foot base in the Closet K, is 9 inches high; the door is 7 feet 6 inches high, and the window breast 2 feet high above the floor.

The door shown in the Passage N, is 7 feet 6 inches high by 3 feet wide; the plaster cornice is 6 inches on the wall, and 5 inches on the ceiling.

The door shown in the Passage O, is 7 feet 6 inches high by 2 feet 10 inches wide; and the plaster cornice is 6 inches on the wall by 5 inches on the ceiling.

The archways leading from the staircase, are 9 feet high from the floor to the top of the soffit of the arch.

Roof.—The section of the principal Roof is cut on a line perpendicular with the other section lines, with the exception of the lantern light, which diverges from the straight line. The ridge boards are 13 inches deep by $1\frac{1}{2}$ inch thick. The rafters are $7\frac{1}{2}$ inches deep at the bottom, and 6 inches at the top, by 2 inches thick, placed 1 foot $3\frac{1}{2}$ inches apart; baulks, 5 inches deep by $1\frac{3}{4}$ inch thick; ceiling joists, 7 inches deep by 2 inches thick.

The roofs over the wings are of the same dimensions as described for the principal roof.

DETAILS.—The drawing marked A, represents the inside of half of one of the sides of the lantern light over the staircase; also a section of the sill, lintel, and cross bar.

The drawing marked B, is the plan of one-fourth of the lantern, shown from the upper side. The bars and mullions are divided on the sill and lintel, so as to radiate to the centres formed by the intersection of the diagonal mullions.

The drawing marked C, is a full-size section of the mullion, standing square on the plan E.

The drawing marked D, is a section of the cross bar, full size.

The drawings marked E, show the different mullions and bars on the rake, drawn to one-fourth of the full size.

PLATE XXXIII.—GRECIAN DORIC ORDER AND DETAILS.

GRECIAN DORIC ORDER, *Figure 1.*—*Grecian Entablature and Antae*, in imitation of those executed in the Choragic Monument of Trysallus, both of which are highly esteemed, as being amongst the best examples we have in Grecian architecture of purity of style and harmony of composition.

Figure 2.—*Grecian Doric Entablature, and Capital of Column*, imitated from the Temple of Minerva, at Athens.

Figure 3.—Plan of the Soffit in the above entablature, showing the mutules, with the bells or circular drops. In the application of this order to the Villa, PLATE XXX., the pediment is omitted, owing to the limited extent of the porch.

DETAILS.—The drawing marked A, is one of the vases on the wings of the Villa, PLATE XXX.

The drawing marked B, is a part of the architrave, cornice, pediment, and corner ornament for the windows on the ground floor.

The drawing marked C, is a section of the above architrave.

The details are drawn to the scale of feet, and the orders to the scale of minutes.

DESIGNS FOR A VILLA AFTER THE GOTHIC STYLE.

PLATES XXXIV.—XXXVIII.

THIS building would be suitable for a gentleman of moderate fortune; and if properly situated, a romantic effect would be produced by its projecting roof, and the general irregularity of its outline.

PLATE XXXIV.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A, on the Ground Plan, represents the *Drawing-room*, 19 feet 10 inches by 17 feet 3 inches, exclusive of the bay, 8 feet 6 inches by 3 feet 9 inches; height of ceiling, 13 feet 4 inches.

B, *Dining-room*, 22 feet by 16 feet 6 inches, exclusive of the bay window, and recess for sideboard; the bay being 8 feet 6 inches by 3 feet 6 inches; and the recess, 8 feet 4 inches by 1 foot; height, 13 feet 4 inches.

C, *Parlour*, 16 feet 4 inches by 13 feet 6 inches; height, 13 feet 4 inches.

D, *Bed-room*, 14 feet by 13 feet 2 inches; height, 13 feet 4 inches.

E, *Kitchen*, 16 feet 4 inches by 15 feet; height of ceiling, 10 feet.

F, *Scullery*, 10 feet 9 inches by 10 feet 2 inches; height, 10 feet.

G, *Larder*, 11 feet 3 inches by 6 feet; height, 10 feet.

H, *Waiting-room*, 9 feet 10 inches by 8 feet 6 inches; height of ceiling, 13 feet 4 inches.

K, *Vestibule*, 10 feet 3 inches by 5 feet 6 inches; and 13 feet 2 inches high at the centre of the groined ceiling.

L, *Principal Staircase*, 18 feet 6 inches by 12 feet 6 inches; height from the floor to the ceiling of stair-landing, 13 feet 4 inches; length of steps, 14 feet 4 inches; rise, nearly 6 inches; breadth of tread, $10\frac{1}{4}$ inches.

M, *Passage*, leading from the staircase to the Dining-room, 14 feet 6 inches long by 6 feet 6 inches wide, and 13 feet 2 inches high at the centre of the groined ceiling.

N, *Back Staircases*, 11 feet by 7 feet 10 inches; length of steps, 3 feet 7 inches; breadth of tread, 9 inches; rise, 7 inches.

O, *Passage*, leading from the Passage M, to the kitchen door, 18 feet 6 inches long by 4 feet 8 inches wide, and 13 feet 4 inches high, from the archway to the Passage M, the remainder being 10 feet high.

P, *Passage* to the kitchen, 10 feet 9 inches long by 4 feet 6 inches wide; and 10 feet high.

R, *Water-closet*, 8 feet 6 inches by 5 feet 3 inches; height of ceiling, 12 feet.

S, *Passage* from staircase to the Bed-room D, 5 feet 3 inches by 4 feet 8 inches, and 13 feet 4 inches high.

T, *Entrance-hall*, in the form of an irregular pentagon; width between the parallel sides, 8 feet 6 inches; length of four adjacent sides, 5 feet 10 inches; height of ceiling, 13 feet 4 inches.

FRONT ELEVATION.—The whole extent of the Front, including the wing to the back, and the projection of the oriel window, is 78 feet. The wing to the back extends beyond the principal building in front 6 feet; the height of the wing, from the level of the ground to the eaves of the roof, is 19 feet 8 inches, and to the ridge of the roof, 31 feet 2 inches.

The height of the principal building is 40 feet 6 inches from the level of the ground to the ridge of the roof, and 47 feet 6 inches to the top of the chimney-stalks. The length of the compartment to the right is 19 feet 2 inches; height, from the level of the ground to the eaves of the roof, 26 feet 4 inches, and to the top of the roofs over the windows, 30 feet.

The oriel window on the ground floor is 17 feet 2 inches high from the level of the ground to the top of the battlement; the central part of the window is divided into four compartments by a mullion and transom, $5\frac{1}{2}$ inches thick; the width of each compartment is 2 feet; height of the under compartments, 5 feet in the clear; and the upper compartments are 3 feet 9 inches high from the transom to the top of the soffit of the arch; each of the diagonal openings is 1 foot 3 inches wide in the clear of the reveals, and the same height as the central compartments.

The chamber floor windows over the oriel window, are each 2 feet 8 inches wide by 6 feet 8 inches high; crowned with a tablet which reaches 1 foot 3 inches below the top of the window.

The compartment adjoining the porch to the right is 17 feet 6 inches wide, and 29 feet high from the level of the ground to the eaves of the roof.

The window on the ground floor is divided into four compartments by a stone mullion and transom, $5\frac{1}{2}$ inches thick; the width of each compartment is 2 feet 2 inches; the height of the under compartments is 5 feet in the clear, and the upper compartments are 3 feet 9 inches high from the transom to the top of the soffit of the arch, crowned with a tablet which reaches 1 foot 7 inches below the top of the window.

The window on the chamber floor is divided into two compartments by a stone mullion, $5\frac{1}{2}$ inches thick; the width of each compartment being 2 feet 1 inch by 6 feet 6 inches

high, crowned with a tablet which reaches 1 foot 3 inches below the top of the window. The window on the attic floor is 2 feet 9 inches wide by 4 feet high.

The height of the porch, from the ground to the eaves of the roof, is 12 feet 3 inches and from the ground to the ridge of the roof, 18 feet 9 inches. The entrance to the porch is 4 feet 3 inches wide, raised 1 foot 6 inches above the level of the ground, ascended by three steps, one of which is in the doorway; the door is 8 feet high to the under side of the transom, below the fanlight; the transom being 9 inches thick, and the fanlight 1 foot 4 inches high, to the top of the soffit of the arch.

The window in the porch is 1 foot 10 inches wide by 7 feet 5 inches high, to the top of the soffit of the arch.

The compartment behind the porch is 10 feet wide by 26 feet 10 inches high, from the level of the ground to the eaves of the roof.

The chamber floor window over the porch is divided into two compartments by a stone mullion, $5\frac{1}{2}$ inches thick; the width of each compartment is 2 feet 1 inch by 6 feet 6 inches high, crowned with a tablet which reaches 1 foot 3 inches below the top of the window. The compartment to the left of the porch is 22 feet 8 inches wide by 26 feet 10 inches high, from the level of the ground to the eaves of the roof.

The window on the ground floor is divided into six compartments, by two mullions and a transom, each $5\frac{1}{2}$ inches thick; the width of each compartment is 2 feet 2 inches; the height of the under compartments is 5 feet in the clear; and the upper compartments are 3 feet 9 inches high from the transom to the top of the soffit of the arch, crowned with a tablet which reaches 1 foot 7 inches below the top of the window.

The oriel window on the chamber floor is corbelled out from the wall; its height from the level of the ground to the sill is 18 feet, and from the ground to the top of the battlements 28 feet; the central part of the window is divided into two compartments by a stone mullion, $5\frac{1}{2}$ inches thick; the width of each compartment is 1 foot 7 inches by 6 feet 9 inches high, and each of the diagonal openings is 1 foot wide in the clear of the reveals, by 6 feet 9 inches high. The window on the attic floor is 2 feet 9 inches wide.

The oriel window to the left projects 2 feet 8 inches from the line of wall; its other dimensions are similar to those described in the oriel window to the right. The barge-board, pinnacles, and other ornamental parts, are detailed in PLATE XXXVII.

PLATE XXXV.—CHAMBER FLOOR AND FLANK ELEVATION.

CHAMBER FLOOR.—The space marked A, on the Chamber floor plan, represents a *Bed-room*, 16 feet 10 inches by 14 feet 8 inches; height of ceiling, 10 feet.

B, *Dressing-room*, 11 feet 5 inches by 6 feet 8 inches; height, 10 feet.

C, *Bed-room*, 10 feet 8 inches by 10 feet 3 inches, and 10 feet high.

D, *Bed-room*, 16 feet 6 inches by 13 feet; height of ceiling, 10 feet 4 inches.

E, *Dressing-room*, 12 feet 1 inch by 8 feet 6 inches, exclusive of the recess, 7 feet 3 inches by 1 foot; height, 10 feet 4 inches.

F, *Bed-room*, 17 feet 10 inches by 13 feet 6 inches; height, 10 feet 4 inches.

G, *Dressing-room*, 11 feet 3 inches by 7 feet; height, 10 feet 4 inches.

H, *Bed-room*, 17 feet 4 inches by 15 feet 4 inches, exclusive of the bay window, 7 feet 9 inches by 3 feet 2 inches; height, 10 feet 4 inches; there is also a small closet attached to this room, 6 feet 8 inches by 4 feet 4 inches.

K, *Bed-room*, 13 feet 6 inches by 13 feet 4 inches; height, 10 feet 4 inches.

L, *Bed-room*, 9 feet 6 inches by 8 feet 10 inches; height, 10 feet 4 inches.

M, *Water-closet*, 9 feet 6 inches by 5 feet, and 10 feet 4 inches high.

N, *Staircase*, 17 feet by 12 feet 6 inches; height of ceiling from stair-landing, 13 feet 4 inches; breadth of landing, 5 feet 4 inches.

O, *Back Staircase*, 11 feet 10 inches by 7 feet 10 inches; this stair leads to the attic rooms.

P, *Passage*, from the principal staircase to the Lobby S, 14 feet long by 5 feet 4 inches wide; height of ceiling, 10 feet 4 inches.

R, *Passage*, leading from the Passage P to the Bed-room C, 22 feet 3 inches long by 4 feet 6 inches wide; the height of ceiling, from the Passage P to the archway, is 10 feet 4 inches, and from the archway to the Bed-rooms C and A, it is 10 feet.

The chamber floor in the back wing being 3 feet 4 inches below the chamber floor in the principal part of the building, there is a stair of seven steps in this passage, having a rise of nearly 6 inches each. That portion of the passage branching off to the Bed-room A, is 6 feet 3 inches long by 4 feet wide.

S, *Lobby*, 7 feet 6 inches by 4 feet; height, 10 feet 4 inches.

T, *Passage*, from the staircase to the water-closet, 15 feet 8 inches long and 4 feet 6 inches wide, from the staircase to the archway, the remainder being 4 feet 10 inches wide and 10 feet 4 inches high.

FLANK ELEVATION.—The whole extent of the Flank Elevation, including the parapet in front of the porch, is 65 feet. The height from the level of the ground to the top of the chimney-stalks on the back part of the principal building is 46 feet 4 inches; and the height from the level of the ground to the top of the chimney-stalks on the back wing, is 37 feet. The other heights are similar to those described on the Front Elevation.

The wing to the back extends 14 feet 3 inches beyond the principal building in front. The entrance to the kitchen, a part of which is shown on the Elevation of the back wing, is 3 feet 10 inches wide, raised 1 foot 6 inches above the level of the ground, ascended by three steps, one of which is in the doorway; the door is 7 feet 6 inches high to the under side of the transom below the fanlight; the transom being 4 inches thick, and the fanlight 1 foot high.

The windows on the ground floor of the back wing are 6 feet 6 inches high; the one shown on the Elevation is 3 feet 6 inches wide, and the one on the other side of the door is 3 feet wide, crowned with a tablet which reaches 1 foot 6 inches below the top of the window. The windows on the chamber floor are each 6 feet high; the two shown on the Elevation are each 3 feet 6 inches wide, the other being 3 feet. The compartment to the back extends 17 feet 2 inches. The window on the ground floor is divided into two compartments by a stone mullion, $5\frac{1}{2}$ inches thick, each compartment being 2 feet 2 inches wide by 9 feet high, crowned with a tablet which reaches 1 foot 7 inches below the top of

the window. The windows on the chamber and attic floors, and also the oriel window, are similar to those described on the Front Elevation.

The central compartment, including the break to the front, is 20 feet 6 inches wide; the wing behind the porch extends, in front of that compartment, 9 feet 9 inches, and the porch, including the parapet, extends 13 feet 3 inches.

PLATE XXXVI.—SECTION AND PLAN OF ROOF.

SECTION, Ground Floor.—The section of the Ground floor is cut through the centre of the Passage M, running on a straight line through the staircase, Drawing-room A, and Dining-room B.

The section of the Drawing-room A, shows the sleeper joists, foot base, chimney-piece, doors, window finishing, and plaster cornice. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base, including the upper fascia, is 1 foot 5 inches high. The chimney-piece is 3 feet 4 inches high in the clear, and 4 feet 10 inches high to the top of the shelf, by 3 feet 9 inches wide in the clear, and 5 feet 10 inches wide over the jambs. The doors are 8 feet high in the clear, and 10 feet 2 inches high to the top of the cornice over the architraves, by 3 feet 4 inches wide in the clear. The window breasts are 2 feet high above the floor. The plaster cornice, including the frieze, is 1 foot 2 inches on the wall by 8 inches on the ceiling; the ceiling is formed into panels by mouldings raised on its surface, having an ornamental pendant in the centre panel.

The section of the Dining-room B, shows the sleeper joists, foot base, section of door, window finishing, recess for sideboard, and plaster cornice. The sleeper joists are 8 inches deep. The foot base, including the upper fascia, is 1 foot 5 inches high. The door is 8 feet high in the clear, and 9 feet 10 inches high to the top of the cornice over the architrave. The recess for sideboard is 8 feet 4 inches wide by 10 feet 9 inches high from the floor to the top of the soffit of the arch. The window breasts are 2 feet high above the floor. The plaster cornice, including the frieze, is 1 foot 1 inch on the wall by 7 inches on the ceiling; the ceiling is formed into panels by mouldings raised on its surface. The foot base shown on the section of the Passage M, is 1 foot 1 inch high. The doors are 8 feet high in the clear, and 8 feet $8\frac{1}{2}$ inches high to the top of the architrave, by 3 feet 6 inches wide in the clear. The height from the floor to the springing of the groined arches is 11 feet 5 inches, and the height from the floor to the top of the soffit of the arch between the groined compartments is 12 feet 10 inches.

The section of the staircase shows the foot base, stair, stair-landing, window, plaster cornice, and ceiling. The foot base is 1 foot 1 inch high. The length of the steps is 4 feet 4 inches; breadth of tread, including the projection of the nosing, 1 foot; rise, nearly $6\frac{3}{8}$ inches. The joists in the stair-landing are 9 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The staircase window is divided into three compartments by stone mullions, $6\frac{1}{2}$ inches thick, the width of each compartment being 2 feet in the clear by 12 feet high. The height of the plaster cornice, including the frieze, is 1 foot 9 inches; projection of the cornice from the wall, 6 inches; height of cove, from the top of the cornice to the ceiling, 1 foot 3 inches; depth of pendant from the ceiling 3 feet, its diameter at the top being 5 feet 7 inches.

Chamber Floor.—The section of the Chamber floor is cut on a line perpendicular with the section line on the ground floor, passing through the Bed-room H, the Passages T and P, staircase, Lobby S, and Dressing-room E. The chamber floor joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The section of the Bed-room H, shows the foot base, chimney-piece, and plaster cornice. The foot base is 1 foot high; the chimney-piece is 3 feet high in the clear, and 4 feet high to the top of the shelf, by 3 feet wide in the clear, and 4 feet 5 inches wide over the jambs; and the plaster cornice is 8 inches on the wall by 7 inches on the ceiling.

The section of the Passage T, shows the archway and part of the water-closet door. The archway is 3 feet 10 inches wide by 8 feet 8 inches high to the top of the soffit of the arch. The door is 3 feet wide in the clear by 7 feet 6 inches high, and the plaster cornice is 5 inches on the wall by 5 inches on the ceiling.

The section of the Passage P, shows the foot base, doors, archways in the Passage R, and plaster cornice. The foot base is 1 foot high. The doors are 3 feet wide by 7 feet 6 inches high. The archways are 3 feet 10 inches wide by 8 feet 8 inches high to the top of the soffit of the arch, with the exception of the archway over the stair in the Passage R, the soffit of which is inclined to the horizon at an angle of 1 foot 1 inch on the thickness of the wall; the ceiling over the remaining portion of the stair being also on the rake, falls 8 inches below the soffit of the archway. The plaster cornice is 7 inches on the wall by 8 inches on the ceiling.

The section of the Lobby S, shows the door and plaster cornice. The door is 3 feet wide by 7 feet 6 inches high; and the plaster cornice is 4 inches on the wall by 5 inches on the ceiling.

The section of the Dressing-room E, shows the foot base, window finishing, and plaster cornice. The foot base is 1 foot high. The window breasts are 2 feet 1 inch high above the floor; and the plaster cornice is 7 inches on the wall by 8 inches on the ceiling.

Attic Floor.—The section of the Attic floor and roof is cut on a line perpendicular with the section lines on the other floors, with the exception of that portion of the roof over the staircase where the section line diverges to the centre of the ceiling. The attic floor joists are 9 inches deep by $2\frac{1}{4}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base in the different rooms is 8 inches high. The doors are 3 feet wide by 7 feet high. The window breasts are 2 feet high above the floor. The chimney-piece is 2 feet 8 inches wide in the clear and 3 feet 10 inches wide over the jambs, by 2 feet 10 inches high in the clear and 3 feet 8 inches high to the top of the shelf. The height of the attic rooms, from the floor to the horizontal part of the ceiling, is 8 feet. The ceiling joists, or baulks, are 7 inches deep by 2 inches thick; rafters, 8 inches deep at the bottom and 7 inches at the top, by $2\frac{1}{4}$ inches thick; platform joists, 10 inches deep by $2\frac{1}{4}$ inches thick; ridge boards, 1 foot deep by $1\frac{1}{2}$ inch thick; the ridge boards and pinnacles are framed together by a mortise and tenon, as shown on the section.

PLAN OF ROOF.—The plan of the Roof is drawn so as to represent the one half finished, and the other half in the naked rafters; the space between the rafters is 1 foot $3\frac{1}{2}$ inches; the rafters at the gables are kept close to the wall, and the cross-bearers forming the projection

over the gable walls, are joined to this rafter by a mortise and tenon, and also checked down upon the rafter shown on the wall, which should be properly bedded with lime, in the same manner as the wall plates; the rafter forming the extremity of projection is framed to the cross-bearers; it is also framed to the pinnacles, and to the scantling forming the extremity of projection over the side walls.

The wall plates are 10 inches broad by $1\frac{1}{2}$ inch thick; they should be half checked at the angles and other joinings, and properly bedded with lime.

The water may be carried from the roof by cast-iron pipes, built into the wall, or by lead pipes on the outside.

PLATE XXXVII.—DETAILS.

DETAILS.—The drawing marked A, represents the barge boards, pendants, and angle brackets on the gable ends, the tracery and ornamental parts of which may be wood, but for durability, cast-iron would be preferable.

The drawing marked B, represents a portion of the gable of the porch, showing the barge boards, pinnacle, pendants, angle brackets, and also part of the entrance door.

The drawing marked C, represents the corbel supporting the oriel window on the chamber floor of the Front Elevation.

D is the pinnacle over the drawing A, and other principal gables.

E is the pinnacle on the back wing.

F is placed over the dormer window on the Front Elevation, and also on the enriched battlements over the oriel window.

PLATE XXXVIII.—DETAILS.

DETAILS.—The drawing marked A, is part of the plan of the window below the oriel window shown on the Front Elevation; it gives the form of the reveals, stone mullions, and also the window case, sash frames, shutters, architraves, and other finishings. As the different parts are all drawn to the scale, it will not be necessary to describe their dimensions.

The drawing marked B, represents part of an elevation of the inside of the window and finishings; on the drawing, part of one of the compartments of the window is shown in its finished state, and the others are given without the inside lining, in order to exhibit a method of constructing the case of circular-headed windows, so as the lower sash can be drawn up to the same height as in square-headed windows, whereas in general the case is either finished square from the inside of the parting bead, or the lower sash allowed only to draw up to the springing of the arch.

In making a case on this plan, the pulley stiles are joined to the sill and lintel, as shown on the drawing; the outside linings are nailed to the sill and pulley stile, making a tongued joint at the spring of the arch; pieces of wood moulded to the form of the top of the window, and of the same thickness as the sash frames, are then joined into the space over the upper sash. The outside lining is also moulded, so as to correspond with the top of the window, and

the lining for the parting bead is moulded similar to the outside lining, and of the same thickness as the upright parting bead, which will join it at the spring of the arch; these linings are properly nailed to the centre piece forming the space over the upper sash; the lining forming the parting bead, closing up the whole space between the lintel and soffit of the arch, is made thinner towards the back edges, so as to form a check of nearly one-eighth of an inch for the soffit over the lower sash to rest upon.

The pieces of wood forming the soffit over the lower sash are moulded similar to those over the upper sash, and nearly one-fourth of an inch thicker than the sash frames. They are cut near the centre, as shown on the drawing, the lower part being hinged to the pulley stile on a table joint; there is also a spring fixed to a piece of wood joined in between the pulley stiles, and by its pressure against the pieces of wood so hinged, they will be kept close down to the checks formed on the parting bead and inside lining when the sash frame is down; when it is up, the hinged pieces will be thrown back, as shown on the drawing, the pulley stiles being checked out to receive them. The upper part of the soffit turns on a pivot fixed to the parting bead; its own weight will be sufficient to keep it close to the checks when the sash frame is down. The inside lining is checked on the back, similar to the parting bead, and moulded on the face, as shown on the drawing. The length of the radiuses for describing the arches are shown by dotted lines. The weights in the centre mullions, for balancing the sashes, will require a pulley at the top similar to the weight of a clock, so that one weight may balance two sashes.

The drawing marked C, is a section of the transom and meeting bars.

The drawing marked D, is a section of the shutter moulding, with part of the stile and panel, full size.

DESIGNS FOR A VILLA AFTER THE CASTELLATED GOTHIC STYLE.

PLATES XXXIX., XL.

THE picturesque character of this description of Villa, arising from the peculiarity of its construction, renders it well adapted for the more remote and thinly-peopled rural districts.

It contains sufficient accommodation for a family of moderate means.

PLATE XXXIX.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A, on the Ground Plan, represents the *Drawing-room* or *Parlour*, 19 feet by 15 feet 3 inches; height of ceiling, 12 feet 6 inches.

B, *Dining-room*, 19 feet by 15 feet 3 inches; height, 12 feet 6 inches.

C, *Bed-room*, of an irregular form; length of longest side, 15 feet; mean width, 9 feet 8 inches; height, 12 feet 6 inches.

D, *Kitchen*, 15 feet 3 inches by 12 feet 6 inches; height, 12 feet 6 inches.

E, *Servants' room*, 9 feet by 6 feet 3 inches; height, 12 feet 6 inches.

F, *Larder*, 6 feet 3 inches by 6 feet, and 12 feet 6 inches high.

G, *Staircase*, 9 feet 4 inches wide by 19 feet 7 inches long between the farthest points; height, from the floor to the ceiling of stair-landing, 12 feet 6 inches; length of steps, 3 feet 9 inches; rise, $6\frac{1}{2}$ inches; breadth of tread, $10\frac{1}{4}$ inches.

H, *Entrance-hall*, 6 feet 8 inches wide by 13 feet mean length, and 12 feet 6 inches high.

L, *Closet*, of a triangular form; length of sides, 7 feet 3 inches, 6 feet 3 inches, and 4 feet 2 inches.

FRONT ELEVATION.—The whole extent of the Front, between the extreme angles of the wings, is 69 feet 2 inches; and the width of the hexagonal compartment in the centre is 30 feet. The height of the wings, from the level of the ground to the top of the battlements, is 16 feet 6 inches; to the ridge of the roof, 20 feet 9 inches; and from the ground to the top of the pinnacles on the gable ends, 26 feet. The height of the centre compartment, from the level of the ground to the top of the battlements, is 29 feet 4 inches; to the top of the roof, 32 feet 4 inches; to the top of the turrets, 33 feet; and from the ground to the top of the pinnacle on the centre of the roof, 37 feet 3 inches.

The entrance is 3 feet 9 inches wide, raised 1 foot 6 inches above the level of the ground, and ascended by 3 steps; the height of the door, from the upper step to the top of the soffit of the arch, is 9 feet. The width of the small window on each side of the door is 1 foot by 5 feet 8 inches high, to the top of the soffit of the arch.

The other windows on the ground floor are divided into two compartments by a stone mullion, $5\frac{1}{2}$ inches thick, each compartment being 2 feet 1 inch wide by 6 feet 9 inches high; these windows are crowned with tablets, which reach 1 foot 6 inches below the top of the window. The window on the chamber floor is divided into two compartments by a stone mullion, $5\frac{1}{2}$ inches thick, each compartment being 2 feet wide by 6 feet 3 inches high, crowned with a tablet, which reaches 1 foot 5 inches below the top of the window.

The turrets, including their corbels, are each 8 feet 3 inches high by 2 feet 8 inches in diameter, and project three-quarters of a circle out from the angles of the plain faces of the hexagonal body. It is intended that the flues be carried up in the turrets.

PLATE XL.—CHAMBER FLOOR AND BACK ELEVATION.

CHAMBER FLOOR.—The space marked A, on the Chamber floor, represents a *Bed-room* of an irregular hexagonal form, its greatest length being 18 feet, and its greatest width 11 feet height of ceiling, 11 feet.

B, *Bed-room*, of the same dimensions as the former.

G, *Staircase*; its greatest length is 16 feet 3 inches, and its greatest width 11 feet; height from the stair-landing to the ceiling, 11 feet.

D, *Water-closet*.

BACK ELEVATION.—The extreme length of the Back Elevation is 69 feet 2 inches; the width of the hexagonal body between the wings on the ground floor, is 31 feet 9 inches. On the chamber floor it is the same as described on the Front Elevation. The width of the gable ends

of the wings is 19 feet 6 inches; the height of the different parts of this elevation is similar to those described on the Front Elevation; the windows and details are also similar to those on the front.

DESIGNS FOR A VILLA.

PLATES XLI.—XLV.

THIS Villa would be very well adapted for a suburban situation, or small country seat, being capable of affording ample accommodation for a genteel family of moderate fortune.

PLATE XLI.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A, on the Ground Plan, represents the *Drawing-room*, 19 feet by 16 feet; height of ceiling, 12 feet 4 inches.

B, *Dining-room*, of the same dimensions as the Drawing-room.

C, *Parlour*, 14 feet 8 inches by 13 feet; height, 12 feet 4 inches.

D, *Kitchen*, 14 feet 8 inches by 12 feet; height, 12 feet 4 inches.

E, *Scullery*, 10 feet 2 inches by 8 feet 3 inches; height of ceiling, 9 feet 6 inches.

F, *Pantry*, 4 feet 8 inches by 3 feet 6 inches; height, 9 feet 6 inches.

G, *Waiting-room*, 10 feet by 5 feet 3 inches; height of ceiling, 12 feet 4 inches.

H, *Washing-house*, 12 feet 4 inches by 10 feet 2 inches; height of ceiling, 9 feet 6 inches.

K, *Bath-room*, 10 feet by 4 feet 2 inches; height, 12 feet 4 inches.

L, *Water-closet*, 5 feet 10 inches by 4 feet; height, 10 feet.

M, *Entrance-hall*, 11 feet 3 inches by 10 feet; height, 12 feet 4 inches.

N, *Staircase*, 17 feet by 11 feet 10 inches; height, from the floor to the under side of stair-landing, 12 feet 6 inches, and from stair-landing to ceiling, 11 feet; length of steps, 3 feet 10 inches; rise, nearly $6\frac{1}{4}$ inches; breadth of tread, $9\frac{3}{4}$ inches, exclusive of the projection of nosing.

O, *Passage*, from the staircase to the parlour, 9 feet 6 inches long by 4 feet 3 inches wide, and 12 feet 4 inches high.

P, *Passage*, from the staircase to the passage leading to the kitchen, 10 feet 9 inches long by 4 feet 3 inches wide, and 12 feet 4 inches high.

R, *Passage*, communicating with the kitchen door and Passage P, 17 feet long by 4 feet 2 inches wide; height of the portion between the Passage P, and the archway through the wall, 12 feet 4 inches, the remainder being 9 feet 6 inches; lighted by a fanlight over the kitchen door.

S, *Lobby*, 4 feet by 3 feet 10 inches, and 12 feet 4 inches high.

FRONT ELEVATION.—The whole extent of the Front Elevation, including the projection of the window at each end, is 62 feet 10 inches; the centre compartment, which recedes back

from the gable ends, is 9 feet 8 inches wide; the gable ends are each 22 feet 4 inches wide; and the projection to each end on the back part of the building is 4 feet 3 inches. The height, from the level of the ground to the eaves of the roof, is 25 feet; to the ridge of the roof, 34 feet 4 inches; and from the level of the ground to the top of the chimney-stalks, 39 feet 10 inches.

The entrance within the porch is 4 feet wide in the clear, and 8 feet high to the under side of the transom between the door and fanlight; the transom being 6 inches thick, and the fanlight 2 feet high; the entrance is raised 1 foot 7 inches above the level of the ground, ascended by three steps, one of which is in the doorway; the small window on each side of the entrance is 1 foot 4 inches wide by 7 feet 8 inches high. The piers supporting the balcony over the porch stand 2 feet 4 inches from the wall. The height of the piers, including base and capital, is 11 feet 4 inches. The entablature, 2 feet 5 inches, and the balcony railing, 2 feet 9 inches. The centre opening between the piers is 4 feet 8 inches; and each of the side openings 1 foot. The piers are detailed in PLATE XLIV.

The Venetian windows on the ground floor are 8 feet 6 inches high in the clear; the centre compartment is 4 feet wide, and each of the side compartments, 1 foot 4 inches. The pilasters, entablature, and consoles supporting the balcony are shown in detail in PLATE XLIV.

The chamber floor windows are 17 feet from the ground, the one over the porch is divided into two compartments by a mullion 9 inches thick, each compartment being 2 feet 2 inches wide by 6 feet 9 inches high.

The other windows are each 3 feet 10 inches wide by 6 feet 9 inches high, the architraves are 9 inches broad; over the architrave is a frieze, cornice, and pediment, supported at each extremity of the cornice by a truss.

PLATE XLII.—CHAMBER FLOOR AND END ELEVATION.

CHAMBER FLOOR.—The space marked A, on the plan, represents a *Bed-room*, 16 feet by 14 feet; height of ceiling, 11 feet.

B, *Dressing-room*, or small *Bed-room*, 11 feet by 10 feet 3 inches, exclusive of the recess 4 feet 9 inches by 4 feet; height, 11 feet.

C, *Bed-room*, 16 feet by 14 feet; height, 11 feet.

D, *Dressing-room*, of the same dimensions as the *Dressing-room* B.

E, *Bed-room*, 14 feet 3 inches by 10 feet 8 inches; height, 11 feet.

F, *Bed-room*, 11 feet by 10 feet 3 inches; height, 11 feet.

G, *Bed-room*, 14 feet 3 inches by 12 feet 2 inches; height, 11 feet.

H, *Closet*, 8 feet 7 inches by 5 feet 6 inches; height, 11 feet.

I, *Water-closet*, 5 feet by 3 feet 6 inches; and 11 feet high.

L, *Passage*, from the staircase to the *Bed-room* G, 10 feet 4 inches long, by 4 feet wide; height of ceiling, 11 feet.

K, *Passage*, from the staircase to the *Bed-room* E, 11 feet 9 inches long, by 4 feet wide, and 11 feet high.

END ELEVATION.—The extent of the End Elevation, including the wing to the back, and projection of window to the front, is 49 feet 3 inches; the extent of the back wing is 12 feet,

of the gable end 18 feet 8 inches, and of the compartment to the front 18 feet 3 inches, the projection of the window to the front being 4 inches; and the projection of the compartment to the back, standing behind the wing, is 1 foot 3 inches. The height of the back wing, from the level of the ground to the eaves of the roof, is 12 feet, to the ridge of the roof, 19 feet 8 inches, and from the level of the ground to the top of the chimney-stalks, 23 feet 8 inches. The height, from the level of the ground to the ridge of the roof over the compartment to the back, is 30 feet 4 inches, and to the top of the chimney-stalk, 34 feet 4 inches. The other heights on this Elevation are similar to those described in the Front Elevation.

The window in the wing to the back is 4 feet wide by 6 feet 9 inches high. The architrave around the window is 8 inches broad.

The window on the ground floor, in the gable end, is divided into two compartments, by a pilaster, $9\frac{3}{4}$ inches broad; each compartment is 2 feet 9 inches wide by 8 feet 6 inches high; the entablature, consoles, and balcony over this window are similar to those on the Front Elevation. The other window on the ground floor is 4 feet wide by 8 feet 6 inches high. The architrave around this window is 9 inches broad; over the architrave is a frieze and cornice, supported by trusses.

The chamber floor windows are each 3 feet 10 inches wide by 6 feet 9 inches high; the architraves are 8 inches broad, those around the window in the gable end are broke on the lintel and jambs; and those around the window in the compartment to the front are broke on the bottom of the jambs.

PLATE XLIII.—PLAN OF ROOF AND SECTION.

PLAN OF ROOF.—The plan of the Roof is drawn so as to represent the one half in its finished state, and the other half in the naked rafters; the space between the rafters is 1 foot $3\frac{1}{2}$ inches; the rafters forming the projection over the gable wall are framed to cross-bearers resting on the wall, and joined to the other rafters on the wall; and also to the ridge board and scantling, forming the extremity of projection over the side walls.

The wall plates are 9 inches broad, by $1\frac{1}{2}$ inch thick; half checked at the angles and other joinings, and properly bedded with lime.

The water may be carried from the roof by cast-iron pipes built into the wall, or by lead pipes on the outside.

SECTION, Ground Floor.—The section of the Ground floor is cut through the centre of the Drawing-room A, running in a straight line through the Entrance-hall, and centre of the Dining-room B.

The section of the Drawing-room A, shows the sleeper joists, foot base, chimney-piece, doors, window finishing, plaster cornice, and ceiling. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base, including the upper fascia, is 1 foot 7 inches high. The chimney-piece is 3 feet 4 inches high in the clear, and 4 feet 9 inches high to the top of the shelf; by 3 feet 2 inches wide in the clear, and 5 feet 6 inches wide over the greatest projection of the jambs. The doors are 8 feet high in the clear, and 9 feet, $10\frac{3}{4}$ inches high to the top of the cornice over the architraves, by 3 feet 5 inches wide in the

clear, and 4 feet $10\frac{3}{4}$ inches wide over the architraves. The window breasts are 2 feet 2 inches high above the floor. The plaster cornice, including the frieze, is 1 foot on the wall, by 9 inches on the ceiling; the ornament on the centre of the ceiling is 5 feet diameter; the remainder of the ceiling is plain.

The section of the Entrance-hall M, shows the foot base, door, sidelights, plaster cornice, and ceiling. The foot base is 1 foot high, and the door is 4 feet wide in the clear, by 8 feet high to the under side of the transom between the door and fanlight, the transom being 6 inches thick, and the fanlight 2 feet high; the window or borrowed light on each side of the door is 1 foot 4 inches wide by 7 feet 8 inches high; the finishing of this door, and also the plaster cornice, is shown in detail in PLATE XLV.

The section of the Dining-room B, shows the sleeper joists, foot base, surbase, doors and window finishing, chimney-piece, and plaster cornice. The sleeper joists, doors, and window finishing, are similar to those described in the Drawing-room A. The foot base is $11\frac{1}{2}$ inches high. The surbase is $5\frac{3}{4}$ inches deep, its lower edge being 2 feet 7 inches above the level of the floor. The chimney-piece is 3 feet 4 inches high in the clear, and 4 feet 9 inches high to the top of the shelf, by 3 feet 4 inches wide in the clear, and 5 feet 2 inches wide over the jambs. The plaster cornice is 10 inches on the wall, by 10 inches on the ceiling.

Chamber Floor.—The section of the Chamber floor is cut, in a line perpendicular with the section line on the ground floor, passing through the Bed-room C, Dressing-rooms D and B, and the Bed-room A. The Chamber floor joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The section of the Bed-room C, shows the foot base, chimney-piece, doors, window finishing, and plaster cornice. The foot base is 11 inches high. The chimney-piece is 3 feet high in the clear, and 4 feet 2 inches high to the top of the shelf, by 2 feet 9 inches wide in the clear, and 4 feet wide over the jambs. The doors are 7 feet 4 inches high in the clear, by 3 feet wide. The window breasts are 2 feet high above the floor. The plaster cornice is 7 inches on the wall, by 8 inches on the ceiling.

The section of the Dressing-room D, shows the foot base, door, chimney-piece, and plaster cornice. The foot base is 11 inches high. The door is 7 feet 4 inches high in the clear, by 3 feet wide. The chimney-piece is 2 feet 10 inches high in the clear, and 3 feet 10 inches high to the top of the shelf, by 2 feet 7 inches wide in the clear, and 3 feet 10 inches wide over the jambs. The plaster cornice is 5 inches on the wall, by 6 inches on the ceiling.

The Dressing-room B, is similar to the Dressing-room D, and the Bed-room A, is similar to the Bed-room C.

Roof.—The section of the Roof shows the ceiling joists, rafters, baulks, ridge boards, and cantalivers. The ceiling joists are 7 inches deep by 2 inches thick; rafters 8 inches deep at the bottom, and $6\frac{1}{2}$ inches at the top, by $2\frac{1}{4}$ inches thick; baulks 5 inches deep by $1\frac{3}{4}$ inch thick; ridge boards 13 inches deep by $1\frac{1}{2}$ inch thick; cantalivers 5 inches deep by $2\frac{1}{4}$ inches thick; the beams supporting the roofs over the Bed-rooms A and C, are 13 inches deep by 8 inches thick; platform joists 8 inches deep by $2\frac{1}{2}$ inches thick.

PLATE XLIV.—DETAILS.

DETAILS.—The drawing marked A, represents the capital and part of one of the pillars or piers of the porch, and the drawing marked B, shows the base of the same pillar.

The upper part of the drawing marked C, exhibits a front view of one of the consoles, and a portion of the entablature of the Venetian windows; the lower part of the same drawing is a front view of the capital and upper part of one of the pilasters; the drawing marked D, shows the base of the pilaster.

The drawing marked E, is a side view of the capital, console, and entablature; and the drawing marked F, is a side view of the base of the same.

PLATE XLV.—BASE, SURBASE, AND DOOR FINISHING.

The drawing marked A, is a section of the cornice in the Entrance-hall, likewise a section of part of the door, also the transom and fanlight, with a side view of the Door finishing.

The drawing marked C, is a front view of part of the door, fanlight, and sidelight, with their finishings; and also a front view of part of the plaster cornice.

The drawing marked B, is a section of part of one of the Dining and Drawing-room doors, showing also a section of the architrave, and door cornice.

The drawing marked D, is a section of the surbase in the Dining-room.

The drawing marked E, is a section of the foot base in the Dining-room.

The drawing marked F, is a section of the foot base in the Drawing-room.

DESIGNS FOR TWO COTTAGES IN THE GRECIAN AND GOTHIC STYLES.

PLATE XLVI.

COTTAGE IN THE GRECIAN STYLE.—*Figures 1, 2, and 3*, are plans for a small Cottage in the *Grecian Style*.

GROUND PLAN, *Figure 1*.—The space marked A, represents the *Parlour*, 12 feet 9 inches by 12 feet; height of ceiling 9 feet 9 inches.

B, *Bed-room*, 12 feet by 8 feet 10 inches; height, 9 feet 9 inches.

C, *Bed-room*, 12 feet by 10 feet 9 inches; height, 9 feet 9 inches.

D, *Kitchen*, 12 feet 6 inches by 10 feet 9 inches; and 9 feet 9 inches high; the fixed bed in the kitchen may be concealed by a door if required.

E, *Pantry*, 4 feet 4 inches by 1 foot 6 inches.

FRONT ELEVATION, *Figure 2*.—The length is 33 feet 9 inches. The height from the level of the ground to the top of the blocking-course is 12 feet 6 inches, to the ridge of the roof, 16 feet 4 inches, and from the ground to the top of the chimney-stalks, 16 feet 8 inches.

The entrance is 3 feet 6 inches wide, raised 1 foot 1 inch above the level of the ground, ascended by two steps; the height of the door from the upper step to the underside of the transom between the door and fanlight is 6 feet 10 inches, the transom being 4 inches thick, and the fanlight 9 inches high.

The windows are each 3 feet 8 inches wide by 6 feet 2 inches high. The architraves around the door and windows are $8\frac{1}{2}$ inches at the bottom, and 7 inches at the top, with a break at top of $1\frac{1}{2}$ inch.

TRANSVERSE SECTION, *Figure 3*.—The section is cut through the entrance-door, running on a straight line along the passage, and through the pantry and kitchen bed, showing the form of the roof, also the doors and other finishings.

The foot base in the passage is 10 inches high. The kitchen and bed-room doors are 3 feet wide by 7 feet high. The kitchen bed-door is 3 feet 9 inches wide by 7 feet high, opening in two halves. Over the kitchen bed and pantry is an intersole 2 feet high.

The ceiling joists are 7 inches deep by 2 inches thick; the rafters $7\frac{1}{2}$ inches at the bottom, and 6 inches at the top by $2\frac{1}{4}$ inches thick; collar beam 9 inches deep by $2\frac{1}{4}$ inches thick, half-checked into the rafters; struts 4 inches broad by 2 inches thick.

COTTAGE IN THE GOTHIC STYLE.—*Figures 4, 5, and 6*, are plans for a Cottage in the Gothic Style.

GROUND PLAN, *Figure 4*.—The space marked A, represents the *Dining-room*, 14 feet by 13 feet 6 inches, exclusive of the window bay, 6 feet 8 inches by 2 feet 6 inches; height of ceiling, 9 feet 8 inches.

B, *Parlour*, 13 feet 6 inches by 11 feet 4 inches; height, 9 feet 8 inches.

C, *Bed-room*, 12 feet 3 inches by 9 feet 6 inches; height, 9 feet 8 inches.

D, *Kitchen*, 12 feet 9 inches by 11 feet 6 inches; height, 9 feet 8 inches.

E, *Entrance-hall*, 13 feet 4 inches by 6 feet, and 9 feet 8 inches high.

F, *Staircase*, and Passage leading to the Kitchen; the staircase is 12 feet 6 inches by 6 feet, and the passage 4 feet 6 inches long by 4 feet wide; length of steps 3 feet, rise $6\frac{3}{4}$ inches, breadth of tread $8\frac{1}{2}$ inches; the space below the stair may be fitted up for a water-closet.

G, *Pantry*, 4 feet 6 inches by 3 feet.

FRONT ELEVATION, *Figure 5*.—The whole extent of the Front, including the wing (to the right), is 38 feet 4 inches; the wing is 2 feet 6 inches, and the gable end 17 feet 6 inches. The height, from the level of the ground to the eaves of the roof, is 12 feet 8 inches, to the ridge of the roof, 22 feet 10 inches, and from the ground to the top of the chimney-stalks, 26 feet 8 inches.

The Entrance is 3 feet 6 inches wide, raised 1 foot 1 inch above the level of the ground, ascended by two steps; the height from the upper step to the under side of the transom between the door and fanlight is 7 feet, the transom being $4\frac{1}{2}$ inches thick, and the fanlight 1 foot $1\frac{1}{2}$ inch high.

The Oriel window on the Ground floor is 11 feet 2 inches high from the level of the ground, to the top of the cornice, and 12 feet 5 inches high to the top of the pavilion roof; the central part of the Oriel window is divided into two compartments, each 1 foot 9 inches wide by 6 feet 4 inches high; the diagonal openings are each 10 inches wide in the clear of the reveals. The

other window, on the Ground floor, is divided into two compartments, each 1 foot 9 inches wide by 6 feet 4 inches high; the top of this window, and also the door, are crowned with tablets. The window on the Chamber floor is 13 feet 5 inches from the ground, its width is 2 feet 9 inches by 4 feet high.

SECTION, Figure 6, Ground Floor.—The section of the Ground floor is cut through the centre of the Parlour B, running in a straight line through the Entrance-hall and Dining-room A.

The section of the Parlour shows the sleeper joists, foot base, chimney-piece, door, window finishing, and plaster cornice. The sleeper joists are 7 inches deep by $2\frac{1}{4}$ inches thick, placed 1 foot $3\frac{3}{4}$ inches apart. The foot base is 10 inches high. The chimney-piece is 3 feet high in the clear, and 3 feet 10 inches high to the top of the shelf, by 2 feet 10 inches wide in the clear, and 3 feet 10 inches wide over the jambs. The door is 7 feet high in the clear, by 2 feet 9 inches wide, the room door being 3 feet wide. The window breasts are 2 feet 2 inches high above the floor. The plaster cornice is 6 inches on the wall, by 7 inches on the ceiling.

The Section of the Entrance-hall shows the archway, part of the water-closet door, stair, and staircase window. The archway is 3 feet 10 inches wide by 7 feet 10 inches high to the top of the soffit of the arch. The water-closet door is 2 feet 6 inches wide by 7 feet high. The staircase window is 2 feet 3 inches wide by 4 feet 6 inches high.

The section of the Dining-room shows the sleeper joists, foot base, chimney-piece, door, and plaster cornice. The sleeper joists and foot base are similar to those in the Parlour. The chimney-piece is 3 feet high in the clear, and 4 feet high to the top of the shelf, by 3 feet wide in the clear, and 4 feet 4 inches wide over the jambs. The door is 7 feet high in the clear, by 3 feet 10 inches wide. The plaster cornice is 6 inches on the wall, by 9 inches on the ceiling.

Chamber Floor.—The section of the Chamber floor is cut on a line perpendicular with the section line on the Ground floor, showing part of the roof and bed-rooms. The Chamber floor joists are 9 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base in the different rooms is 8 inches high. The chimney-pieces are each 2 feet 10 inches high in the clear, and 3 feet 5 inches high to the top of the jamb moulding, by 2 feet 5 inches wide in the clear, and 3 feet 7 inches wide over the jambs. The doors are 2 feet 10 inches wide by 6 feet 9 inches high. The window breasts are 1 foot 11 inches high above the floor. The form of the ceilings will be understood by the Drawings.

Roof.—The section of the Roof shows part of the rafters, ridge boards, platform joists, ceiling joists, and cantalivers; the rafters are 8 inches deep at the bottom, and 7 inches at the top, by $2\frac{1}{4}$ inches thick; ceiling joists, 6 inches deep by 2 inches thick; ridge boards, 1 foot deep by $1\frac{1}{2}$ inch thick; platform joists, 10 inches deep by $2\frac{1}{4}$ inches thick; cantalivers, 7 inches deep at the extremity, and 4 inches at the wall, by $2\frac{1}{2}$ inches thick.

DESIGNS FOR A VILLA.

PLATES XLVII.—L.

THIS Villa would afford accommodation suitable for a gentleman of moderate fortune.

PLATE XLVII.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A, on the Ground plan, represents the *Drawing-room*, 19 feet 10 inches by 17 feet 3 inches, exclusive of the window bay, 9 feet by 2 feet 9 inches; height of ceiling, 12 feet 6 inches.

B, *Dining-room*, 20 feet by 16 feet 6 inches, exclusive of the window bay, 9 feet by 2 feet 9 inches; height, 12 feet 6 inches.

C, *Parlour*, 16 feet 9 inches by 12 feet 8 inches; height, 12 feet 6 inches.

D, *Waiting-room*, 11 feet 8 inches by 6 feet 10 inches, and 12 feet 6 inches high.

E, *Kitchen*, 16 feet by 15 feet 8 inches; height of ceiling, 9 feet 8 inches.

F, *Servants'-room*, 12 feet 4 inches by 10 feet; height, 9 feet 8 inches.

G, *Laundry*, 15 feet by 12 feet 3 inches; height, 9 feet 8 inches.

H, *Pantry*, 8 feet 4 inches by 6 feet 6 inches, and 9 feet 8 inches high.

K, *Water-closet*, 7 feet by 4 feet 6 inches; height of ceiling, 12 feet 6 inches.

L, *Principal Staircase*, 18 feet 4 inches by 12 feet 6 inches; height from the floor to the under side of stair-landing, 12 feet 10 inches; length of steps 4 feet, rise rather more than 6½ inches, breadth of tread 10 inches, exclusive of the projection of nosing.

M, *Back Staircase*, 8 feet 3 inches by 6 feet 10 inches; length of steps 3 feet 2 inches, rise nearly 6¾ inches, breadth of tread 9 inches.

N, *Passage*, from the Staircase to the Dining-room, 16 feet 4 inches long by 5 feet 5 inches wide, and 12 feet 6 inches high.

O, *Lobby*, 4 feet 6 inches by 4 feet; height, 10 feet 6 inches.

P, *Passage*, leading to the Laundry and Kitchen, 14 feet long by 4 feet 3 inches wide, and 9 feet 8 inches high.

Q, *Passage*, from the Passage N, to the Kitchen, 11 feet 6 inches long by 4 feet 4 inches wide, and 12 feet 6 inches high.

R, *Entrance-hall*, 12 feet 3 inches by 10 feet 3 inches; height of ceiling, 12 feet 6 inches.

FRONT ELEVATION.—The whole extent of the Front Elevation, including the projection of the back wing, is 65 feet. The back wing extends 10 feet beyond the Oriel window in the body of the building. The height of the wing from the level of the ground to the eaves of the roof is 18 feet, to the top of the roof over the window 21 feet 3 inches, and from the level of the ground to the ridge of the principal roof 24 feet 6 inches. The window, which is partly shown on the Ground floor of the wing, is divided into two compartments by a stone mullion

6 inches broad, each compartment being 2 feet wide by 6 feet 9 inches high. The window on the Chamber floor is 3 feet wide by 4 feet high.

The height of the principal building, from the level of the ground to the eaves of the roof, is 25 feet; to the top of the roofs over the windows 29 feet 4 inches; to the ridge of the principal roof 32 feet 10 inches; and from the level of the ground to the top of the chimney-stalks 37 feet 4 inches.

The extent of the principal building in front, including the projection of the windows to each end, is 55 feet; the Oriel window to the right projects 2 feet 4 inches, and the window to the left 9 inches. The compartment to the right is 20 feet 4 inches wide; and the compartment to the left 31 feet 7 inches. The width over the porch is 11 feet 3 inches; its height from the level of the ground to the under side of the entablature is 12 feet, the entablature being 2 feet 9 inches high, and the parapet 3 feet. The entrance to the porch is 5 feet wide, raised 1 foot 6 inches above the level of the ground, and ascended by three steps. The pillars of the porch are shown in detail in PLATE L.

The Entrance within the porch is 4 feet wide, raised 6 inches above the floor, by 8 feet high to the under side of the transom, between the door and fanlight, the transom being 6 inches thick, and the fanlight 1 foot high; the small window on each side of the entrance is 1 foot wide by 7 feet 8 inches high.

The Window on the Ground floor, in the compartment to the right, is divided into three compartments, each 2 feet wide by 8 feet 2 inches high. The Oriel window on the Ground floor, to the left of the porch, is 8 feet 2 inches high in the clear; the central opening is 4 feet wide in the clear of the reveals, and each of the diagonal openings is 1 foot 2 inches wide. The Chamber floor windows are 17 feet 9 inches from the level of the ground. The one in the compartment to the right, and also the one over the porch, are each 6 feet 6 inches high by 3 feet 9 inches wide. The Oriel window on the Chamber floor is 6 feet 6 inches high; the central opening is 3 feet 9 inches wide, and each of the diagonal openings 1 foot wide. The ornamental pinnacles over the windows are given on a large scale in PLATE L.

PLATE XLVIII.—CHAMBER FLOOR AND FLANK ELEVATION.

CHAMBER FLOOR.—The space marked A, on the plan, represents a *Bed-room*, 16 feet 6 inches by 16 feet 4 inches; height of ceiling, 10 feet 8 inches.

B, *Dressing-room*, 11 feet 3 inches square; height, 10 feet 8 inches.

C, *Bed-room*, 17 feet 3 inches by 13 feet 10 inches, exclusive of the window bay, 8 feet 4 inches by 2 feet 3 inches; height, 10 feet 8 inches.

D, *Dressing-room*, 10 feet 9 inches by 6 feet 3 inches; height, 10 feet 8 inches; lighted from the roof.

E, *Bed-room*, 16 feet 10 inches by 12 feet 8 inches; height, 10 feet 8 inches.

F, *Bed-room*, 13 feet by 10 feet, and 10 feet 8 inches high.

G, *Bed-room*, 14 feet 6 inches by 10 feet 9 inches; height of ceiling, 7 feet 10 inches.

H, *Bed-room*, 13 feet by 11 feet; height, 7 feet 10 inches.

K, *Nursery*, 15 feet by 12 feet 8 inches; height, 7 feet 10 inches.

L, *Closet*, 6 feet 3 inches by 6 feet; height, 7 feet 10 inches.

M, *Bath-room*, 9 feet 4 inches by 7 feet 2 inches; height of ceiling, 10 feet 8 inches.

N, *Water-closet*, 5 feet 6 inches by 4 feet; height, 10 feet 8 inches.

O, *Principal Staircase*, 18 feet by 12 feet 6 inches; height from the stair-landing to ceiling, 11 feet 1 inch.

P, *Passage*, 15 feet 8 inches long by 4 feet 10 inches wide; height, 10 feet 8 inches; lighted from the roof.

R, *Lobby*, 6 feet 3 inches by 6 feet; height, 10 feet 8 inches; lighted from the roof.

S, *Lobby*, 3 feet 10 inches by 3 feet 8 inches; height, 10 feet 8 inches.

T, *Passage*, 23 feet 6 inches long by 4 feet wide; height, 7 feet 10 inches; there are six steps in this passage, of 6 inches rise each.

U, *Back Staircase and Passage*. The Staircase is 11 feet 8 inches by 6 feet 10 inches, and the Passage from the staircase to the door of the Bed-room, H, is 6 feet 4 inches long by 4 feet wide; height, 7 feet 10 inches.

V, *Closets*, each 4 feet 6 inches by 2 feet.

FLANK ELEVATION.—The whole extent of the Flank Elevation, including the wing to the back, and the projection of the window to the front, is 72 feet 6 inches. The heights of the principal building, and also the back wing, are similar to those described on the Front Elevation, the height from the level of the ground to the top of the chimney-stalk on the back wing being 28 feet 6 inches.

The wing to the back extends 28 feet 5 inches, the gable end being 16 feet 3 inches wide.

The windows on the Ground floor of this wing are each 6 feet 8 inches high by 3 feet 6 inches wide; and the Chamber floor windows in the wing are 14 feet 8 inches from the ground, each being 4 feet 3 inches high by 3 feet 4 inches wide.

The extent of the principal part of the building, including the projection of the window to the front, is 44 feet 1 inch. The window projects 9 inches on the Ground floor, and 4 inches on the Chamber floor.

The wing in front projects 4 feet beyond the oriel window, and the porch 2 feet 4 inches; the oriel window projecting from the body of the building 2 feet 6 inches on the Ground floor, and 2 feet on the Chamber floor.

The compartment to the back is 13 feet 5 inches wide; the width of the compartment to the front is 23 feet 7 inches.

The window on the Ground floor, in the compartment to the back, is 8 feet 2 inches high by 4 feet wide.

The window on the Ground floor to the front, and also the Chamber floor windows, are similar to those described in the Front Elevation.

PLATE XLIX.—SECTION AND PLAN OF ROOF.

SECTION.—The section of the Ground floor is cut through the porch, running in a straight line through the window to the right of the entrance-door, entrance-hall, staircase, kitchen, and

servants' room. The low parapet inclosing the porch on the flank is 3 feet high above the floor; it is perforated with semicircular-headed openings, 1 foot 4 inches high by $3\frac{1}{2}$ inches wide.

The ceiling of the porch is 11 feet high to the bottom of the panel; the ceiling joists are 5 inches deep by $1\frac{1}{2}$ inch thick; platform joists, 8 inches deep by $2\frac{1}{4}$ inches thick; the parapet over the porch is 2 feet 9 inches high above the platform, perforated with semicircular-headed openings, 1 foot high by $3\frac{1}{2}$ inches wide.

The section of the Entrance-hall shows the foot base, window finishing, niche, and plaster cornice. The foot base is 1 foot high. The window breasts are 2 feet high above the floor. The niche is 2 feet $7\frac{3}{4}$ inches wide by 8 feet 3 inches high to the top of the soffit of the arch. The methods for constructing the head of the niche are shown in detail in PLATE L. The plaster cornice, including the frieze, is 1 foot on the wall by 6 inches on the ceiling.

The section of the Staircase shows the foot base, door, stair, stair-landing, and plaster cornice. The foot base is 1 foot high. The doors on the Ground floor are each 3 feet 4 inches wide by 7 feet 9 inches high; and the door on the Chamber floor, which is partly shown through the archway, is 3 feet wide by 7 feet 6 inches high, and the archway is 4 feet 2 inches wide by 8 feet 6 inches high. The joists of the stair-landing are 8 inches deep by $2\frac{1}{4}$ inches thick, supported by a beam 1 foot deep by 4 inches thick. The plaster cornice, including the frieze, is 10 inches on the wall by 6 inches on the ceiling; the ceiling is formed into one panel, sunk 5 inches; breadth of beam, 2 feet.

The section of the Kitchen shows the foot base, chimney, and plaster cornice. The foot base is 9 inches high. The chimney is 4 feet 9 inches high in the clear; the central space is 4 feet 9 inches wide; and each of the side spaces is 1 foot 10 inches wide. The plaster cornice is 3 inches on the wall by 3 inches on the ceiling.

The section of the Servants' room shows the foot base, window finishing, and plaster cornice. The foot base is 8 inches high. The window breasts are 2 feet high above the floor; the breasts and elbows are plain, and the shutters panelled. The plaster cornice is 2 inches on the wall by 3 inches on the ceiling. The floors shown on the ground are all stone.

The cellars shown below the Servants' room, and the others below the Laundry, will have access from the back staircase.

The section of the Chamber floor is cut in a line perpendicular with the section line on the Ground floor, passing through the Bed-room F, Staircase, and Bed-rooms G and H. The Chamber floor joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The section of the Bed-room F, shows the foot base and plaster cornice. The foot base is 11 inches high. The plaster cornice is 6 inches on the wall, by 7 inches on the ceiling.

The section of the Bed-room G, shows the foot base, window finishing, side view of chimney-piece, and plaster cornice. The foot base is 10 inches high. The window breasts are 2 feet high above the floor. The chimney-piece is 4 feet high to the top of the shelf. The plaster cornice is $2\frac{1}{2}$ inches on the ceiling by 2 inches on the cove; the cove extends from 1 foot below the ceiling, to 1 foot 5 inches from the perpendicular of the wall. The finishing shown in the Bed-room H, is similar to that in the Bed-room G.

Roof.—The section of the Roof is cut in a line perpendicular with the other section lines. The ceiling joists of the principal roof are 8 inches deep by $2\frac{1}{4}$ inches thick; baulks, 5 inches

deep by $1\frac{1}{2}$ inch thick; rafters, $8\frac{1}{2}$ inches deep at the bottom, and 7 inches at the top, by $2\frac{1}{4}$ inches thick; ridge-boards, 1 foot 2 inches deep by $1\frac{1}{2}$ inch thick; platform joist, 9 inches deep by $2\frac{1}{2}$ inches thick; beams of ditto, 1 foot deep by $5\frac{1}{2}$ inches thick.

In the Roof over the back wing, the baulks or ceiling joists are $6\frac{1}{2}$ inches deep by 2 inches thick; rafters, $7\frac{1}{2}$ inches deep at the bottom, and 6 inches at the top, by $2\frac{1}{4}$ inches thick; ridge-boards, 1 foot deep by $1\frac{1}{2}$ inch thick.

PLAN OF ROOF.—In order to make the drawing more comprehensive, the one half of the Roof is shown in the naked rafters, and the other half in its finished state; the space between the rafters is 1 foot $3\frac{1}{2}$ inches. The wall plates are 10 inches broad by $1\frac{1}{2}$ inch thick; they should be half-checked at the angles and other joinings, and properly bedded with lime. The roof light over the staircase is 7 feet 6 inches long by 5 feet 6 inches wide, and its perpendicular height is 2 feet 9 inches.

The roof light over the Dressing-room D, and Lobby R, is 6 feet 6 inches long by 3 feet wide; this light may serve both apartments, by having horizontal sashes placed in their respective ceilings. The roof light over the Passage P, is 5 feet 6 inches long by 2 feet 9 inches wide. The water may be carried from the roof by cast-iron pipes, built into the wall, or by lead pipes on the outside.

PLATE L.—DETAILS.

DETAILS.—*Figures 1 and 2* exhibit two methods for constructing the ribs for the head of a spherical niche. Although there are various forms of niches, and also various methods for constructing them, it is hoped the examples given will be sufficient to show the principles on which all niches of a spherical form depend. If the head of a niche be any portion of a sphere, its form must depend entirely upon the properties thereof; all the sections of a sphere made by a plane are circles; those passing through the centre are equal, being the greatest circles which can be formed by cutting the sphere; likewise a section of the sphere which is more remote from the centre than another, is a circle of less diameter than that which is nearer.

By dividing a hemisphere into two equal parts, by a plane passing through the centre perpendicular to the base, each part will be a quarter of the hemisphere, and their two planes will be at a right angle, consequently each plane will be a semicircle, representing the head of a niche, the plan and elevation of which are both semicircles. In this case, the ribs, the ground plan, and the face, may all be drawn with the same radius; but if a hemisphere be cut by a plane at right angles to its base (not through the centre), it will then be cut into two unequal portions, the common section of which will be a semicircle. The smaller portion will then represent the head of the niche referred to, the plan of which is the segment of a circle, and the elevation a semicircle, the segment being part of the base of the hemisphere; and the elevation is a semicircle upon the same base, but cut on a plane remote from the centre, it will therefore have a less radius than the segment at right angles to it. Now, since the under edges of the ribs of the niche are in the spheric surface, by constructing them in vertical planes passing through the axis of the sphere, as shown in *Figure 1*, the ribs will

all have the same curvature, being portions of equal circles, and are consequently drawn with the same radius as the base of the niche. Whereas in *Figure 2*, the ribs are all in parallel planes perpendicular to the wall, cutting the spheric surface at right angles to its base, consequently the ribs are all equal portions of different circles.

Figure 1.—No. 1 exhibits the Plan, and No. 2 the Elevation. No. 3 is the Rib that stands in the centre of the plan over A B. No. 4 is the Rib that stands over C D E F, and No. 5 is the Rib that stands over G H I K.

To find the different ribs required, take the radius L B, from the plan, which is the radius of the sphere, from the centre *a*, No. 3; describe the arc from *b*, to the base line *a c*, then take the distance A L, on the plan No. 1, from the base line No. 3, which is equal to the distance from *a* to *c*; from the point *c*, draw a straight line perpendicular to the base, cutting the arc at *b*; then the portion of the arc intercepted between the point *b* and the base, is the under side of the rib. From the centre *a*, No. 4, with the radius L B, describe the arc from *b* to the base line *a c d*, take the distance C L, on the plan No. 1, from the base line No. 4, which is equal to the distance from *a* to *c*, and the distance E L, on the plan, which is equal to the distance from *a* to *d*; from the points *c* and *d* draw a straight line perpendicular to the base, cutting the arc at *b* and *e*, then the portion of the arc intercepted between the point *b* and the base is the arris line next to the back, and the part intercepted between the point *e* and the base is the arc forming the arris line next to the front.

The rib, No. 5, is found in the same manner as the former, by taking the distances G L, and I L, on the plan, from the base line, which are equal to the distances from *a* to *c*, and from *a* to *d*, No. 5.

Figure 2.—No. 1 exhibits the Plan, and No. 2 the elevation. From the centre A, of the plan, with the radius A B, describe the inside circle of the plan all round; produce the ribs till they meet the circle opposite the plan at C E D and F G; through A, the centre of the plan, draw H A I, parallel to B K L the face of the niche, cutting the plan of the ribs produced at O and P; likewise draw the line M N, parallel to H A I, cutting the ribs produced at a distance from the circumference of the circle, equal to the length of the respective ribs on the plan.

On the point A, the centre, with the radius A G, describe the arc C N; from the point P, with the radius P D, describe the arc D U; and from the point O, with the radius O F, describe the arc F S; and from the points E and G, draw lines perpendicular to the plan of the ribs, cutting the base F O and P D; then again from the centre P, with the radius extending on the base to the line E, describe the arc from the line E to T; and from the centre O, with the radius extending on the base to the line G, describe the arc from the line G to R; then will C N be the inside of the rib No. 5; and U D and T E the inside and bevelling of the rib No. 4; likewise S F and R G, the inside and bevelling of the rib No. 3.

The ribs, Nos. 3, 4, and 5, correspond to the plans marked 3, 4, and 5. The dimensions of the niche, and also of the different sizes of the ribs, will be ascertained from the scale A.

The drawing marked A, represents the capital; B, the base of one of the pillars in the porch; and C, one of the finials over the gable tops, to the scale B.

DESIGNS FOR A VILLA IN THE GOTHIC STYLE.

PLATES LI.—LIH.

PLATE LI.—GROUND PLAN AND FRONT ELEVATION.

GROUND PLAN.—The space marked A, on the Ground Plan, represents the *Drawing-room* 19 feet by 15 feet 10 inches, exclusive of the window bay, 10 feet by 3 feet 2 inches; height of ceiling, 12 feet.

B, *Parlour*, 15 feet 3 inches by 14 feet 4 inches, exclusive of the window bay, 8 feet 10 inches by 3 feet 6 inches; height, 12 feet.

C, *Dining-room*, 18 feet 6 inches by 17 feet 6 inches; height, 12 feet.

D, *Kitchen*, 15 feet 2 inches by 14 feet 9 inches; and 12 feet high.

E, *Scullery*, 11 feet 10 inches by 11 feet; height of ceiling, 8 feet 10 inches.

F, *Larder*, 8 feet square; height, 8 feet 10 inches.

G, *Pantry*, 9 feet 10 inches by 4 feet 6 inches; and 8 feet 10 inches high.

H, *Vestibule*, 16 feet 9 inches by 6 feet 10 inches; height of ceiling, 12 feet.

K, *Staircase*, 10 feet 8 inches by 8 feet 10 inches; height of ceiling, 22 feet; length of steps, 4 feet; rise rather more than $6\frac{3}{4}$ inches; breadth of tread, 10 inches; below the second flight of the stair is a *Water-closet*, 10 feet 8 inches by 4 feet.

L, *Passage*, 14 feet long by 4 feet 3 inches wide; height of ceiling, 12 feet.

M, *Passage*, 21 feet long by 4 feet 3 inches wide; height, from passage L to archway, 12 feet; the remainder being 8 feet 10 inches.

N, *Entrance-hall*, of a pentagonal form, two sides of which are each 9 feet 5 inches, and the other three sides are each 5 feet 6 inches; height of ceiling, 10 feet 9 inches.

FRONT ELEVATION.—The whole extent of the Front Elevation, including the projection of the Oriel window, is 56 feet 4 inches. The height from the level of the ground to the eaves of the roof is 20 feet 6 inches; to the ridge of the roofs over the dormer windows, 26 feet; to the ridge of the principal roof, 30 feet; and from the level of the ground to the top of the chimney-stalks, 34 feet 2 inches; the height of the porch from the level of the ground to the eaves of the roof is 11 feet 2 inches, and to the ridge of the roof 15 feet 8 inches.

The entrance to the porch, raised 1 foot 7 inches above the level of the ground, ascended by three steps, is 4 feet wide by 8 feet 2 inches high from the top of the upper step. The window in the porch is 7 feet high, by 1 foot 9 inches wide in the clear of the reveals.

The windows on the Ground floor, in the compartment to the right, are each 3 feet 10 inches wide by 7 feet 8 inches high, crowned with tablets which reach 1 foot 3 inches below the top of the window. The Oriel window on the Ground floor, in the centre com-

partment, is 7 feet 8 inches high; the central opening is 3 feet 10 inches wide; and each of the diagonal openings 1 foot 2 inches wide in the clear of the revels.

The Chamber floor windows are 16 feet 3 inches from the level of the ground: they are each 5 feet high by 3 feet 6 inches wide; the one in the centre compartment is crowned with a tablet, which reaches 1 foot 2 inches below the top of the window.

PLATE LII.—CHAMBER FLOOR AND FLANK ELEVATION.

CHAMBER FLOOR.—The space marked A, on the Plan, represents a *Bed-room*, 15 feet 8 inches by 14 feet 3 inches; height of ceiling, 9 feet 2 inches.

B, *Bed-room*, 17 feet by 11 feet 10 inches; height, 9 feet 2 inches.

C, *Dressing-room*, 12 feet by 6 feet 6 inches; height, 9 feet 2 inches.

D, *Bed-room*, 15 feet 2 inches by 12 feet 3 inches; height, 9 feet 2 inches.

E, *Dressing-room*, 10 feet by 8 feet 8 inches; height, 9 feet 2 inches.

F, *Bed-room*, 15 feet 8 inches by 13 feet, exclusive of the window bay, 10 feet by 3 feet 2 inches; height, 9 feet 2 inches.

G, *Dressing-room*, 10 feet 9 inches by 6 feet; height, 9 feet 2 inches.

H, *Bath-room and Water-closet*, 10 feet by 5 feet; height, 8 feet 9 inches.

K, *Pantry*, 4 feet by 2 feet 3 inches.

L, *Staircase*, 15 feet 6 inches by 8 feet 10 inches; height from stair-landing, 9 feet 2 inches.

M, *Passage*, from the staircase to the bed-rooms B and D, 4 feet 6 inches wide; and the passages leading to the bed-rooms A and F, are each 5 feet wide by 9 feet 2 inches high.

FLANK ELEVATION.—The whole extent of the Flank Elevation, including the projection of the Oriel window to the front, and the wing to the back, is 62 feet 8 inches.

The height of the back wing from the level of the ground to the eaves of the roof is 11 feet; to the ridge of the roof over the projection to the front, 17 feet 6 inches; and to the ridge of the principal roof, 19 feet 8 inches.

The entrance to the back wing is 3 feet 6 inches wide, raised 1 foot 7 inches above the level of the ground, by 6 feet 9 inches high from the top of the upper step to the under side of the transom between the door and fanlight; the transom being 3 inches thick, and the fanlight 1 foot high.

The window shown on the back wing is 6 feet high by 3 feet 4 inches wide, crowned with a tablet which reaches 1 foot below the top of the window.

The dimensions of the principal part of this elevation are similar to those described on the Front Elevation.

PLATE LIII.—SECTION AND PLAN OF ROOF.

SECTION.—The section of the Ground floor is cut through the centre of the parlour B, running in a straight line through the vestibule H, the passage L, and staircase; on reaching the wall the line diverges so as to cut through the staircase and water-closet windows; and the section of the back wing is cut through the pantry G, and scullery E, in a line perpendicular with the centre of the roof.

The section of the parlour B, shows the sleeper joists, foot base, chimney-piece, doors, window finishing, and plaster cornice. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base is 1 foot high. The chimney-piece is 3 feet high in the clear, and 4 feet high to the top of the shelf, by 3 feet wide in the clear, and 4 feet 6 inches wide over the jambs. The doors are 7 feet 10 inches high; the press door is 3 feet wide, and the width of the entrance door is 3 feet 3 inches. The window breasts are 2 feet 2 inches high above the floor. The plaster cornice is 8 inches on the wall by 9 inches on the ceiling.

The plaster cornice in the vestibule H, is 6 inches on the wall by 8 inches on the ceiling; and in the passage L, 4 inches on the wall by 6 inches on the ceiling; the other dimensions being similar to those described in the parlour B.

The section of the staircase is cut through the upper flight of the stair, showing the water-closet below: the height of the water-closet is 7 feet 2 inches at the window, and 9 feet at the door.

The section of the Chamber floor is cut in a line perpendicular with the section line on the Ground floor, passing through the bed-room D, dressing-room E, and staircase. The Chamber floor joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

The section of the bed-room D, shows the foot base, chimney-piece, door, window-finishing, and plaster cornice. The foot base is 10 inches high. The chimney-piece is 3 feet high in the clear, and 3 feet 10 inches high to the top of the shelf, by 2 feet 9 inches wide in the clear, and 4 feet wide over the jambs. The door is 7 feet 2 inches high by 2 feet 10 inches wide. The window breast is 2 feet high above the floor. The plaster cornice, including the cove, is 1 foot on the wall by 1 foot on the ceiling.

The foot base and plaster cornice in the dressing-room E, is similar to that in the bed-room D.

The door on the stair-landing L, is seen through the archway; the archway is 4 feet wide by 8 feet high to the top of the soffit of the arch; and the door is 7 feet 2 inches high by 3 feet wide. The plaster cornice in the stair-landing is 5 inches on the wall by 6 inches on the ceiling; and in the staircase, 11 inches on the wall by 10 inches on the ceiling.

The section of the back wing, on the Ground floor, shows the window finishing in the pantry G, the furnace in the scullery E, also the foot base in both apartments. The window breast is 2 feet 4 inches high above the floor. The furnace is 4 feet high, and the foot base is 7 inches high; both furnace and floor should be stone.

The attic floor joists are 8 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The attic room is 6 feet 4 inches high in the centre; the window is 3 feet 3 inches high by 2 feet wide; the ridge-board is 11 inches deep by $1\frac{1}{2}$ inch thick; rafters, 7 inches deep at the bottom, and 6 inches at the top, by $2\frac{1}{4}$ inches thick.

The section of the principal roof is cut in a line perpendicular with the other section lines, showing ceiling joists, rafters, baulks, ridge-boards, and cantalivers; the ceiling joists are 6 inches deep by 2 inches thick, placed 1 foot 4 inches apart; rafters, 8 inches deep at the bottom, and 7 inches at the top by $2\frac{1}{4}$ inches thick; baulks, 5 inches deep by $1\frac{3}{4}$ inch thick; ridge-boards 1 foot deep by $1\frac{1}{2}$ inch thick; cantalivers 6 inches deep by $2\frac{1}{4}$ inches thick.

PLAN OF ROOF.—The Plan of the Roof is drawn so as to show it in its finished state. The Roof-light over the passage M, is 3 feet 9 inches long by 3 feet 2 inches wide. The size of the platform, and other parts of the Roof will be ascertained by the scale. The water may be carried from the Roof by lead pipes on the outside, or by cast-iron pipes built into the wall.

DESIGNS FOR A MANSION IN THE CASTELLATED GOTHIC STYLE.

PLATES LIV.—LX.

THE most appropriate site for a building of the design and dimensions figured in the following plates, would be a rising ground in a richly but not too densely wooded country. The noble effect of such a mansion is much heightened by the near neighbourhood of a lake or broad river.

PLATE LIV.—GROUND PLAN.

GROUND PLAN.—The space marked A on the Plan represents the *Drawing-room*, 40 feet by 24 feet 4 inches; height of ceiling, 17 feet 6 inches.

B, small *Drawing-room*, 24 feet 4 inches by 18 feet 3 inches, exclusive of the window bay, 14 feet by 4 feet 6 inches; height, 17 feet 6 inches.

C, *Dining-room*, 40 feet by 24 feet 4 inches; height, 17 feet 6 inches.

D, *Library*, 35 feet by 22 feet, exclusive of the window bay, 11 feet 10 inches by 4 feet 9 inches; height, 17 feet 6 inches. The small octagonal closet off the library is 8 feet 4 inches by 8 feet 4 inches; height, 14 feet 6 inches.

E, *Breakfast-room*, 23 feet 4 inches by 17 feet 8 inches, exclusive of the window bay, 13 feet 10 inches by 4 feet; height, 17 feet 6 inches.

F, *Business-room*, 23 feet 4 inches by 18 feet 4 inches; height, 17 feet 6 inches.

G, *Bed-room*, 19 feet 4 inches by 18 feet 8 inches, exclusive of the window bay, 11 feet 10 inches by 4 feet 9 inches; height, 17 feet 6 inches.

H, *Dressing-room*, 19 feet 4 inches by 9 feet 6 inches; height, 17 feet 6 inches. The small octagonal closet adjoining is 8 feet 4 inches by 8 feet 4 inches; height, 14 feet 6 inches.

I, *Waiting-room*, 14 feet by 7 feet 2 inches; height, 14 feet 6 inches.

J, *Water-closet*, 8 feet 6 inches square, exclusive of recess for seat, 5 feet 4 inches by 1 foot 10 inches; height, 15 feet.

K, *Water-closet*, 8 feet 4 inches by 6 feet 3 inches, exclusive of recess for seat, 4 feet 8 inches by 1 foot 8 inches; height, 14 feet.

L, *Steward's-room*, 14 feet by 9 feet 8 inches; height, 9 feet 3 inches.

M, *Strong-room*, 9 feet by 8 feet; height, 8 feet 6 inches.

N, *Pantry*, 8 feet by 7 feet 4 inches; height, 9 feet 3 inches.

O, *Closet*, 8 feet 10 inches by 5 feet; height, 14 feet.

P, *Grand Staircase*, 23 feet 4 inches by 18 feet 4 inches; height from the floor to the under side of stair-landing 18 feet, length of steps 5 feet 8 inches, breadth of tread 1 foot, rise $6\frac{1}{2}$ inches.

Q, *Servants' Staircase*, 25 feet 6 inches by 12 feet 6 inches; height from the floor to the under side of stair-landing 18 feet, length of steps 4 feet 9 inches, breadth of tread 10 inches, exclusive of the projection of nosing, rise nearly $6\frac{3}{8}$ inches.

R, *Back Staircase*, leading to the sunk floor, also to the intersole over the steward's apartments.

S, *Passage*, 23 feet 4 inches long by 6 feet 9 inches wide; height, 17 feet 6 inches.

T, *Passage*, 4 feet 9 inches wide; height, 9 feet 3 inches.

U, *Lobby*, 8 feet 9 inches by 5 feet; height, 15 feet.

V, *Lobby*, 6 feet 10 inches by 5 feet; height, 14 feet.

W, *Saloon*, 39 feet 9 inches by 39 feet 9 inches; height of ceiling below the galleries, 17 feet 10 inches, and from the floor to the highest part of the inner sash frame, 48 feet 4 inches.

X, *Entrance-hall*, 21 feet by 21 feet; height of groined ceiling from the floor to the top of the soffit of arches, 17 feet.

Y, *Green-house*, 26 feet 2 inches by 21 feet 9 inches; height from the floor to the ceiling of roof light, 19 feet 6 inches.

Z, *Porch*, 12 feet 4 inches by 10 feet 9 inches; height of groined ceiling, 17 feet to the top of the soffit of arches.

PLATE LV.—CHAMBER FLOOR.

CHAMBER FLOOR.—The space marked A, on the plan, represents a *Bed-room*, 24 feet 4 inches by 16 feet 9 inches; height of ceiling, 13 feet 9 inches.

B, *Dressing-room*, 12 feet by 11 feet 2 inches; height, 13 feet 9 inches.

C, *Bed-room*, 18 feet 3 inches by 17 feet 6 inches, exclusive of the window bay, 14 feet by 4 feet 6 inches; height, 13 feet 9 inches.

D, *Dressing-room*, 18 feet 3 inches by 11 feet 3 inches; height, 13 feet 9 inches.

E, *Bed-room*, 25 feet 7 inches by 24 feet 4 inches; height, 13 feet 9 inches.

F, *Dressing-room*, 14 feet by 11 feet 3 inches; height, 13 feet 9 inches.

G, *Bed-room*, 14 feet by 12 feet 10 inches; height, 13 feet 9 inches.

H, *Bed-room*, 23 feet 4 inches by 17 feet 8 inches, exclusive of the window bay, 13 feet 10 inches by 4 feet; height, 14 feet 3 inches.

I, *Dressing-room*, 11 feet 10 inches by 11 feet 2 inches; height, 13 feet 9 inches.

J, *Bed-room*, 23 feet 8 inches by 18 feet 8 inches; height, 14 feet 3 inches.

K, *Dressing-room*, 13 feet 5 inches by 11 feet 8 inches; height, 14 feet 3 inches.

L, *Bed-room*, 19 feet 4 inches by 18 feet; height, 14 feet 3 inches.

M, *Dressing-room*, 8 feet 4 inches by 8 feet 4 inches; height, 12 feet.

N, *Bed-room*, 22 feet by 20 feet 10 inches; height, 14 feet 3 inches.

O, *Dressing-room*, 8 feet 4 inches by 8 feet 4 inches; height, 12 feet.

P, *Parlour*, 21 feet 4 inches by 21 feet 2 inches; height, 13 feet 9 inches.

- Q, *Bath-room*, 14 feet by 11 feet; height, 12 feet 6 inches.
 R, *Water-closet*, 8 feet by 6 feet; height, 12 feet.
 S, *Water-closet*, 9 feet by 8 feet, exclusive of the recess for seat, 5 feet 4 inches by 1 foot 6 inches; height, 12 feet.
 T, *Water-closet*, 8 feet 6 inches by 6 feet 6 inches; height, 12 feet.
 U, *Pantry*, 6 feet 6 inches by 5 feet 10 inches; height, 12 feet.
 V, V, *Pantries*, each 6 feet 9 inches by 4 feet 9 inches; and 12 feet high.
 W, *Pantry*, 7 feet 10 inches by 4 feet 4 inches; height, 12 feet.
 X, *Saloon*, 39 feet 9 inches by 39 feet 9 inches; breadth of galleries within the railings, 7 feet 10 inches; height from gallery floor to the highest part of the inner sash frame, 29 feet 4 inches.
 Y, *Grand Staircase*, 23 feet 4 inches by 18 feet 4 inches; height from stair-landing, 14 feet 3 inches.
 Z, *Servants' Staircase*, 25 feet 9 inches by 12 feet 6 inches; height from stair-landing, 14 feet 3 inches. *a*, *Staircase* to Attic floor, 8 feet diameter. *b*, *Staircase* to ditto, 15 feet 6 inches by 7 feet 4 inches. *c*, *Lobby*, 6 feet 6 inches by 5 feet 9 inches; height, 13 feet 9 inches. *d*, *Passage*, 9 feet 8 inches by 5 feet 8 inches; height, 13 feet 9 inches. *e*, *Passage*, 4 feet 9 inches by 6 feet 6 inches; height, 14 feet 3 inches. *f*, *Lobby*, 7 feet 6 inches by 6 feet 4 inches; height, 13 feet 9 inches. *g*, *Passage*, 14 feet by 5 feet 7 inches; height, 14 feet 3 inches. *h*, *Lobby*, 8 feet by 5 feet; height, 14 feet 3 inches. *k*, *Passage*, 11 feet 8 inches by 5 feet 4 inches; height, 14 feet 3 inches.

PLATE LVI.—FRONT ELEVATION.

FRONT ELEVATION.—The whole extent of this Elevation, including the wings, is 167 feet 4 inches. The principal part, including the octagonal towers, is 136 feet 10 inches. The entrance within the porch is 5 feet wide in the clear, and 12 feet high to the top of the soffit of the arch; the floor is raised 2 feet 2 inches above the level of the ground, and ascended by four steps of $6\frac{1}{2}$ inch rise, tread 1 foot. The width of the opening of the porch is 9 feet, and its height 16 feet from the level of the ground to the top of the soffit of the arch. The height of the porch from the ground to the top of the enriched battlements, is 23 feet 8 inches, and to the top of the pinnacles 33 feet 8 inches; and its breadth, including the octagonal buttresses, is 17 feet.

The height of the central part, behind the porch, from the level of the ground to the top of the battlements, is 62 feet 6 inches, to the top of the central turrets 66 feet, and from the ground to the top of the turrets, over the octagonal buttresses, 68 feet 9 inches; its breadth (including the octagonal buttresses) is 47 feet. The height of the bay, behind the porch, from the ground to the top of the battlements is 39 feet, to the top of the octagonal buttresses 44 feet, and its breadth over the octagonal buttresses is 29 feet 8 inches.

The diagonal windows on the Ground floor are each 4 feet wide, including the mullion, and 12 feet 4 inches high. The window in the bay, above the porch, is divided into four compartments, each 1 foot $6\frac{1}{2}$ inches wide by 9 feet high; and each of the diagonal windows is divided

into two compartments, 1 foot $6\frac{1}{2}$ inches wide by 9 feet high. The window above the bay is divided into three compartments, each 1 foot 11 inches wide by 7 feet 9 inches high, crowned with a tablet which reaches 2 feet below the top of the window.

The space on each side of the central part, extending to the octagonal tower, is 33 feet 5 inches wide, and 41 feet high, from the ground to the top of the battlements; to the top of the turrets 43 feet 3 inches; to the top of the roof 41 feet 6 inches; and from the ground to the top of the chimney-stalks 48 feet 10 inches; the oriel windows on the Ground floor are each 22 feet 9 inches high from the ground to the top of the battlements, and 14 feet 3 inches wide; the central part is divided into six compartments by two mullions and a transom, each 6 inches thick; each compartment is 1 foot 11 inches wide, and 7 feet high from the sill to the transom, and from the transom to the top of the soffit of the arch 4 feet 10 inches; the side openings are each 1 foot 9 inches wide; the window on each side of the oriel window is divided into four compartments by a mullion and a transom, each 6 inches thick; each compartment is 2 feet 2 inches wide, 7 feet high from the sill to the transom, and from the transom to the top of the soffit of the arch 4 feet 10 inches.

The window on the Chamber floor, above the oriel windows, is divided into two compartments, each 1 foot 10 inches wide, and 9 feet high, crowned with a tablet which reaches 2 feet below the top of the window; and the window on each side of it is divided into two compartments, each 2 feet wide and 9 feet high, crowned with tablets which reach 2 feet below the top of the window.

The octagonal tower at each extremity is 11 feet 6 inches wide, and 53 feet 9 inches high from the level of the ground to the top of the battlements; the windows on the Ground floor are 10 feet 4 inches high, crowned with tablets which reach 2 feet below the top of the window; those on the second floor are 9 feet high, crowned with tablets which reach 1 foot 10 inches below the top of the window; and on the third floor they are 7 feet 6 inches high; the width of each of these windows is 1 foot 3 inches.

The extent of the extreme wing, to each end beyond the octagonal tower, is 15 feet 3 inches; its height from the level of the ground to the top of the battlements is 23 feet, and to the top of the pinnacles 13 feet 10 inches.

The entrance is 4 feet 8 inches wide, and 8 feet 9 inches high, raised 2 feet 2 inches above the level of the ground, and ascended by four steps of $6\frac{1}{2}$ inches rise, tread 1 foot. The window is divided into six compartments by two mullions and a transom, each 6 inches thick; the width of each compartment is 1 foot 10 inches, and 7 feet high from the sill to the transom, and from the transom to the top of the soffit of the arch 4 feet 10 inches.

PLATE LVII.—BACK ELEVATION.

BACK ELEVATION.—The whole extent of this Elevation is 167 feet 4 inches. The principal part, including the octagonal buttresses in front of the wings, is 114 feet 6 inches, and including the octagonal buttresses behind the wings, 131 feet 10 inches. The height of the central part, from the level of the ground to the top of the battlements, is 53 feet, and to the top of the turrets, 58 feet 6 inches; its breadth 23 feet 6 inches. The bay, with the oriel windows, is

38 feet 10 inches high from the ground to the top of the battlements, and 16 feet 9 inches wide. The oriel window in the central part on the Ground floor is divided into six compartments by two mullions and a transom, each 6 inches thick; each compartment is 2 feet wide, and 7 feet high from the sill to the transom, and from the transom to the top of the soffit of the arch 4 feet 10 inches. The oriel window over the Ground floor in the central part is divided into six compartments by two mullions and a transom, each 6 inches thick; each compartment is 2 feet wide, and 5 feet 2 inches high from the sill to the transom, and from the transom to the lintel 3 feet 4 inches; the side openings of both windows are each 1 foot 10 inches wide. The window above the bay is divided into three compartments, each 1 foot 8 inches wide, and 7 feet 6 inches high, crowned with a tablet, which reaches 1 foot 9 inches below the top of the window.

The space on each side of the central part, extending to the octagonal buttress, is 40 feet 6 inches wide, and 39 feet 6 inches high from the level of the ground to the top of the battlements, and to the top of the turret on the centre of the space, 46 feet 3 inches. The window in the centre of the space on the Ground floor, is divided into three compartments, each 2 feet 3 inches wide, and 12 feet 4 inches high; and the window on each side of it is divided into two compartments, each 2 feet 3 inches wide, and 12 feet 4 inches high, crowned with tablets which reach 2 feet below the top of the window.

The windows on the Chamber floor are divided into two compartments, each 2 feet 2 inches wide, and 9 feet high, crowned with tablets which reach 1 foot 10 inches below the top of the window. The Attic floor window is divided into three compartments, each 1 foot 3 inches wide; the centre compartment is 4 feet high, and each of the side compartments 3 feet 6 inches. The octagonal buttresses, in front and behind the wings, are each 5 feet wide, and 49 feet 6 inches high.

The extreme wing, to each end, is 26 feet 5 inches. The window in the diagonal face is divided into six compartments by two mullions and a transom, each 6 inches thick; the width of each compartment is 1 foot 10 inches, and 7 feet high from the sill to the transom, and from the transom to the top of the soffit of the arch 4 feet 10 inches; the other windows shown in the wings are divided into four compartments by a mullion and a transom, each 6 inches thick; the width of each compartment is 2 feet 3 inches, and the same height as the former.

PLATE LVIII.—SECTION.

Ground Floor.—The section of the Ground floor is cut through the centre of the Porch, Entrance-hall, Saloon, and small Drawing-room B; and the section of the Sunk floor is cut on a line perpendicular to the section line on the Ground floor.

The height of the cellar below the small Drawing-room is 10 feet 9 inches at the centre of the arches, and the height of the others shown on the section is 11 feet. The cellar doors are 4 feet wide by 8 feet high; window 6 feet high in the clear; window breasts 3 feet 6 inches high from the floor; foot base 12 inches high; the floor and also the foot base should be stone. The kitchen and servants' apartments may be on the sunk floor, lighted from an area to

the back of the building, but it would be preferable to have them in a wing adjoining to the back of the steward's apartments.

The section of the Drawing-room B, on the Ground floor, shows the sleeper joists, foot base, doors, window finishing, and plaster cornice. The sleeper joists are 8 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot 2 inches apart. The foot base, including the upper fascia, is 1 foot 7 inches high. The folding door leading to the Drawing-room A, is 10 feet high by 10 feet wide, and the door leading to the Saloon is 9 feet 2 inches high by 4 feet 3 inches wide. The window breasts are 1 foot 10 inches high above the floor. The plaster cornice, including the frieze, is 1 foot 6 inches on the wall, and 1 foot 3 inches on the ceiling; the ceiling is divided into ornamental panellings by mouldings on the surface.

Saloon.—The section of the Saloon shows the foot base, chimney-piece, doors, gallery, ceiling, and roof lights. The foot base on the Ground floor, including the upper fascia, is 1 foot 7 inches high; the base and also the floor may be stone; and the foot base on the galleries, including the upper fascia, is 1 foot 6 inches high. The chimney-piece is 4 feet 4 inches wide in the clear, and 7 feet 4 inches wide over the jambs, by 4 feet high, and 6 feet high to the top of the shelf. The doors and niches on the Ground floor are shown in detail in PLATE LX.; the doors on the Chamber floor are 9 feet high by 4 feet 3 inches wide. The railing on the gallery is 4 feet 6 inches high above the floor. The groined ceiling is constructed so that the intersection of the ribs forms an octagonal figure in the centre 20 feet 6 inches diameter; into that space the inner glass frame is placed; it is of a spherical form, having a pendant in the centre, which, being also glazed, would cause the light to be more effectually spread throughout the space below; the inner frame should be glazed with stained glass, which would not only have a far more splendid appearance, but would also prevent the roof light from being seen in the Saloon. The roof light is also of an octagonal form, 22 feet diameter at the bottom, and 9 feet 6 inches at the top, the height of the sashes being 8 feet 9 inches; one of the sashes will require to be hinged, so that access may be had to the inside, in order to clean the under-light. The tracery on the walls under the arches is formed with mouldings raised on the surface.

The section of the Entrance-hall shows the foot base, chimney-piece, niche, window finishing, and ceiling. The foot base is 1 foot 2 inches high. The chimney-piece is 3 feet 6 inches wide in the clear, and 6 feet wide over the jambs, by 3 feet 8 inches high in the clear, and 5 feet 4 inches high to the top of the shelf. The niche is of an octagonal form, 3 feet 2 inches wide by 9 feet 9 inches high in the clear, and 12 feet high to the top of the canopy. The window breasts are 2 feet high above the floor.

The groined ceiling is shown in detail in PLATE LIX.

The section of the Porch shows the archway, ceiling, and platform. The archway is 9 feet wide, and 16 feet high from the level of the ground to the top of the soffit of the arch. The groined ceiling is 13 feet high to the springing of the arches, and 16 feet 10 inches high to the top. The platform joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart.

Chamber Floor.—The section of the Chamber floor is cut through the Bed-room C, Lobby c, Saloon and Parlour P, on a line perpendicular to the section line on the Ground floor. The Chamber floor joists are 9 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot 2 inches apart, supported on truss beams, 13 inches deep by 8 inches thick.

The section of the Bed-room C, shows the foot base, door, window finishing, and plaster cornice. The foot base, including the upper fascia, is 1 foot 6 inches high. The door is 8 feet 3 inches high by 3 feet 8 inches wide. The window breasts are 1 foot 9 inches high above the floor. The plaster cornice, including the frieze, is 1 foot 3 inches on the wall, and 1 foot on the ceiling. The door in the Lobby c, is 8 feet 3 inches high by 3 feet 8 inches wide; and the plaster cornice, including the frieze, is 10 inches on the wall, and 7 inches on the ceiling.

The section of the Parlour P, shows the foot base, chimney-piece, door, window finishing, and plaster cornice. The foot base, including the upper fascia, is 1 foot 6 inches high. The chimney-piece is 3 feet 8 inches wide in the clear, and 5 feet 8 inches wide over the jambs by 3 feet 4 inches high in the clear, and 4 feet 8 inches high to the top of the shelf. The door is 8 feet 3 inches high by 3 feet 9 inches wide. The window breasts are 1 foot 9 inches high above the floor. The plaster cornice, including the frieze, is 1 foot 8 inches on the wall, and 9 inches on the ceiling.

Attic Floor.—The section of the Attic floor is cut on a line perpendicular to the section lines of the other floors.

The section of the room over the Bed-room C, shows the floor joists, foot base, chimney-piece, door, window finishing, plaster cornice, ceiling, and platform joists. The floor joists are 12 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot 3 inches apart. The foot base is 11 inches high. The chimney-piece is 3 feet wide in the clear, and 4 feet 8 inches wide over the jambs, by 3 feet high in the clear, and 4 feet 2 inches high to the top of the shelf. The door is 7 feet 9 inches high by 3 feet 6 inches wide. The window breast is 1 foot 2 inches high above the floor. The plaster cornice is 9 inches on the wall, and 6 inches on the ceiling. The platform joists are 8 inches deep by $2\frac{1}{2}$ inches thick; and ceiling joists 4 inches deep by $1\frac{3}{4}$ inch thick, supported by truss beams 13 inches deep by 8 inches thick. The door in the passage adjoining this room is 7 feet 9 inches high by 3 feet 6 inches wide.

The section of the room over the parlour P, shows the floor joists, foot base, chimney-piece, door, window finishing, plaster cornice, ceiling, and platform joists, also the truss beams. The floor joists are 8 inches deep by $2\frac{1}{2}$ inches thick, supported on truss beams 13 inches deep by 8 inches thick. The foot base, chimney-piece, and door, are similar to those described in the other attic room. The window breast is 1 foot 10 inches high above the floor. The plaster cornice is 11 inches on the wall, and 8 inches on the ceiling. The ceiling joists are 4 inches deep by $1\frac{3}{4}$ inch thick; platform joists 11 inches deep by $2\frac{1}{2}$ inches thick; truss beams 12 inches deep by 8 inches thick.

PLATE LIX.—DETAILS.

DETAILS.—*Figure 1* is the plan of the groined ceiling in the Entrance-hall. Part of the plan represents the ceiling in its finished state; the other part shows the naked ribs, also the geometrical lines for finding their different curves.

The given arch A B C, is drawn from four centres, by the following method:—Divide the base A D C into four equal parts, which gives the centres *a, a*; through these centres draw

radii intersecting each other, so as to form an equilateral triangle, extending each radius to the points b, b , which are placed perpendicular to the base, from A and C; then with the radius a A, describe the curve A c , and with the radius a C, describe the curve C c , and in like manner with the radii b a c , describe the curves c B, B c .

The methods of finding the body ribs for the longer and shorter sides of the octagon, and the different angle ribs, are as follows:—

To find the body ribs for the longer side of the octagon.—To the given arch A B C, draw the chord A B for one half the arch, divide it into any number of equal parts, as five, and through the divisions draw lines from the centre D, to terminate in the circumference; draw lines from B through the points in the circumference found by the intersection of the lines D 1, D 2, D 3, D 4, to cut the perpendicular A E at 1, 2, 3, 4; then from the centre A, with the radii A 1, A 2, A 3, A 4, describe the required curves. The perpendicular C F, on the other half of the arch, is divided, and the curves described in like manner.

To find the body rib for the shorter side of the octagon.—From the centre of the base raise the perpendicular I G to the height of the given arch on D B, draw the two chords C G and H G for each side of the arch, divide each into five equal parts as before, and draw the lines I 1, I 2, I 3, and I 4, through the points of division; then raise the lines C K and H L perpendicular on each end of the line C I H, transfer the parts C 1, I 2, &c. from C F to C C and H L, and from the divisions draw lines to the vertex at G, then trace the curve through the points of intersection.

To find the angle ribs.—The different angle ribs are found in like manner: thus—A S, C M, and H P, are the seats of the different ribs, and S T, M N, and P Q, their respective perpendicular heights; the chord lines A T, C N, and H Q, are each divided into five equal parts, and lines drawn from S through the points of division in the chord line A T; from M through the chord line C N, and from P through the chord line H Q. Then the line A U is raised perpendicular to A S, C O to C M, and H R to H P, and the parts found from the given arch on the lines A E, or C F, are transferred respectively to the different perpendiculars; then from the divisions on the line A U, draw lines to the vertex T, from C O to the vertex N, and from H R to the vertex Q; then the different curves are traced through the points of intersection.

The jack ribs.—On the space A C M, the jack ribs are shown on the plan, also perpendicular lines drawn from the extremities of each rib to cut its corresponding rib, showing the portion of the given rib required for each of the jack ribs.

To range the angle ribs; the bottom of the ribs must be bevelled agreeably to the ascent of the groin, and the plan of it drawn upon the level, and from thence they may be drawn perpendicularly from the plan to the rake of the rib; then take a mould to the form of the rib, and by applying it agreeably to the rake to the distance that is marked upon the bottom to be backed off, it will show how much the rib is to bevel all round. The space A M S, and its corresponding spaces, join the seat of the pendant level, and consequently they are of a spherical form.

Figure 2 represents a section of the groined ceiling cut on a straight line from D through M to the centre of the pendant; from thence it diverges to V, then it runs on a straight line to W, and from thence on a straight line to X; on the finished part of the ceiling are shown

one-half of the pendant and drop, and also a front view of one of the corbels at the springing of the groin, likewise a section of one cut through the centre.

The other part of the section represents a portion of the ceiling and wall in the naked framing; also a section of the beams, joists, and flooring above.

PLATE LX.—DETAILS.

DETAILS.—The drawing marked A, is the elevation of one of the doors, and also of one of the niches in the Saloon; and the drawing marked B, is the plan of the same, also of the jamb-linings, the door, door architraves, and foot base, in the small Drawing-room B.

DESIGNS FOR AN ENTRANCE AND LODGES IN THE ELIZABETHAN STYLE.

PLATES LXI.—LXIII.

THE Entrance and Lodges shown in these plates, would be suitable for a large Mansion in the Elizabethan style of architecture.

Figure 1. Ground Plan of the Piers and Gateways.—The whole extent over the octagonal piers is 67 feet 9 inches, and the distance which the gateways recede back from the line of the octagonal piers is 13 feet 9 inches. The width of the central gate, for carriages, is 10 feet 9 inches in the clear above the base; and each of the side gates, for passengers, is 4 feet 9 inches wide in the clear.

Figures 2 and 3 are the Ground Plans of the Lodges, which are both of the same form and dimensions. The space marked A, on the plan, *Figure 3*, is the *Parlour*, 12 feet 3 inches by 11 feet; height of ceiling, 8 feet 9 inches.

B, *Bed-closet*, 11 feet 2 inches by 5 feet 9 inches, exclusive of the bed, 6 feet 2 inches by 4 feet; height, 8 feet 9 inches.

C, *Kitchen*, 13 feet 6 inches by 11 feet 2 inches, exclusive of the bed, 6 feet by 4 feet; height, 8 feet 9 inches.

D, *Lobby*, of a hexagonal form, 4 feet 3 inches on the side; height, 8 feet 9 inches.

Figure 4. Elevation of the Gateways.—The height of the octagonal piers is 12 feet 8 inches by 3 feet thick in the body. The height of the other piers is 10 feet 9 inches to the top of the cornice, and 16 feet to the top of the vase. The height from the roadway to the top of the ornamental arches over the side gates is 12 feet 6 inches, and to the top of the vases 17 feet 4 inches. The height of the circular walls, and also of the piers supporting the arches, is 9 feet. The height of the cast-iron gates is 8 feet.

Figure 5. Front Elevation.—The whole extent of the Front Elevation, in a line parallel to the entrance-door, is 33 feet 3 inches. The height from the level of the ground to the top of the cornice is 11 feet, to the top of the roof 14 feet 8 inches, and from the ground to the top of the chimney-stalks 16 feet 9 inches.

The entrance, raised 1 foot above the ground, ascended by two steps, is 3 feet 3 inches wide by 7 feet high to the top of the soffit of the arch. The lobby windows are each 10 inches wide by 4 feet 8 inches high to the top of the soffit of the arch; the other windows, shown on the Elevation, are 2 feet 4 inches wide by 5 feet high to the top of the soffit of the arch.

Figure 6. End Elevation fronting the road, the whole extent of which is 27 feet 4 inches. The different heights are similar to those of the Front Elevation, also the dimensions of the front window. The back window is 3 feet wide by 5 feet high; and the recess under the chimney-stalk is 3 feet 6 inches wide by 7 feet high.

Figure 7. Section.—The section is cut through the centre of the Kitchen C, running on a straight line through the bed, and Bed-closet B.

The section of the Kitchen C, shows the foot base, windows, and door. The foot base is 7 inches high. The window breasts are 2 feet 3 inches high above the floor. The door is 2 feet 10 inches wide by 7 feet high.

The section of the Bed-closet B, shows the sleeper joists, foot base, door, and side view of the chimney-piece. The sleeper joists are 6 inches deep by 2 inches thick, placed 1 foot 4 inches apart. The foot base is 7 inches high. The door is 2 feet 9 inches wide by 7 feet high; and the chimney-piece is 3 feet high in the clear, and 3 feet 8 inches high to the top of the shelf.

The section of the roof is cut on a line perpendicular to the section line on the Ground floor, showing the ceiling joists, trimmer joist, rafters, and ridge-boards. The ceiling joists are 5 inches deep by 2 inches thick; trimmer joist, 10 inches deep by $2\frac{1}{2}$ inches thick; rafters, 6 inches at the bottom, and 5 inches at the top, by 2 inches thick; ridge-boards, or platform joists, 10 inches deep by 2 inches thick.

Figure 8. Plan of Roof.—The drawing represents the roof in its finished state, also the position of the chimney-stalks, vases, and platform. The platform is 7 feet square.

PLATE LXII.—DETAILS.

DETAILS.—Showing the construction of circular sashes in circular walls, and of the development of the soffit, splayed at the spring and level at the crown; likewise, the method of finding the mould for the facings or architraves.

Figure 1.—Elevation and plan of the window, and of the shutters and facing. *To form the head of the sash frame*, divide the elevation from A to S into any number of equal parts, as 1, 2, 3, 4, 5, 6, and draw perpendiculars to the chord of the half plan W B, which, in order to keep the different parts of the figure more distinct, is transferred to the line W D, which is drawn so as to form an angle with the perpendicular line W C equal to that formed by the chord line W B; consequently, both lines are of equal length. From the points where these perpendiculars intersect the chord of the half plan, draw ordinates perpendicular to the chord of the half plan. Make the ordinates *a d*, *b c*, *e f*, &c., equal to *a* 1, *b* 2, *c* 3, &c.; and the ordinates of the inner curve, *d*, *e*, and *f*, &c., equal to the ordinates *a*, *b*, and *c*, &c.: then, through the points *a*, *b*, *c*, &c., draw a curve, which gives the outer line, and a curve through the points *d*, *e*, *f*, &c., gives the inner line; this will form the face-mould for the sash head, also the mould for the inner edge of the outside facing, and soffit of window case.

To find the curvature of the inside of the soffit, and also the facing or architrave:—The curve line R S, on the Elevation, represents the line of soffit where it is intended to join the window case, and S T the line of the inside of the facing; but as the facing is bevelled at the bottom, to correspond with the splay of the shutter, which can be done by shifting the mould at the bottom, and keeping it level at the top, of course the line thus found for the inside of the facing will also be the line of the soffit; the outside line of the facing at V, may be found by gauging from the inside. To find the curve line S T, divide the curve line R S into any number of parts, as 1, 2, 3, 4, 5, 6; from these points draw ordinates perpendicular to the base, as 6 *d*, 5 *e*, 4 *f*, &c. Then from the common centre, with a radius equal to the length of the base to R, describe an arc to join the line raised perpendicular from R; and from the intersection of the arc and the perpendicular R at 7, draw an angle line to the centre, and from the points where the perpendiculars 6 *d*, 5 *e*, 4 *f*, &c., intersect the angle line at 1, 2, 3, &c., from the common centre, describe arcs cutting the base at *a*, *b*, *c*, &c.; from these points raise perpendiculars, as *a f*, *b e*, *c d*, &c.; then make *a f* equal to *d 6*, *b e* equal to *e 5*, *c d* equal to *f 4*, &c.; and through these points describe the curve line for the inside of the facing.

Figure 2 is the face-mould for the inside facing or architrave, extended so as it may be bent to the cylindrical surface of the wall. From the points S, *f e*, &c., on the Elevation, *Fig. 1*, draw perpendicular ordinates, cutting the plan of the facing at 1, 2, 3, &c. Then, on the base line A B, *Fig. 2*, make the distance from *a* to *b* equal to the distance from 1 to 2 on the plan, and the distance from *b* to *c*, &c., equal to the distance from 2 to 3, &c., so that the line A B will be equal to the curve line O P. Then from the points *a*, *b*, *c*, &c., raise perpendiculars, and make the heights of these perpendiculars to correspond to those on the Elevation, *Fig. 1*. Then through the points 1, 2, 3, 4, 5, 6, 7, draw the line for the concave edge of the mould; the convex edge will be found by gauging from the inside after it is bevelled.

Figure 3 is the development of the soffit of the case, also of the upper side of the sash head and beads. To find the soffit mould on the line A B, *Fig. 3*, make the distance from 1 to 2 equal to the distance from W to *a*, on the head of the sash frame, *Fig. 1*, and the distance from 2 to 3, &c., equal to the distance from *a* to *b*, &c., so that the line A B will be equal to the upper side of the sash head. Then from the line A B, *Fig. 3*, make the ordinates 1 *a*, 2 *e b*, 3 *f c*, &c., respectively to the same height as the corresponding ordinates on the plan are from the line W C to the different parts of the soffit. Then draw lines through the points thus found in the ordinates, which gives the different moulds required. The space A is the inside bead; B, the soffit over the inside sash frame; C, the parting bead; D, the upper side of sash frame, also its space in the soffit of the case; and E is the outside facing.

Figure 4 is the development of the soffit of the sash frame, which is found by making the distance on the base line from 1 to 2 equal to the distance from the line W D to *d*, on the inside line of the sash head, *Fig. 1*, and the distance from 2 to 3, &c., equal to the distance from *d* to *e*, &c., thus making the base line, *Fig. 4*, equal to the length of the inside of the sash frame. Then make the ordinates, 1 *a*, 2 *e b*, 3 *f c*, &c., respectively to the same height as the corresponding ordinates on the plan, in *Fig. 1*, are from the line E, as *d g*, *e h*, *f l*, &c.; drawing lines through the points thus found gives the mould required.

Figure 5 is the development of the arch-bar or cot-bar, on the Elevation, *Fig. 1*. Divide

the half arc of the arch-bar H I, *Fig. 1*, into any number of equal parts, as five; and from the points of division draw perpendiculars to the horizontal line K on the plan; transfer the parts of the horizontal line K a, a b, b c, &c., to *Fig. 5*, from 1 to 2, to 3, &c., to B, and reverse the order from the central point 1 to A, and raise perpendiculars from these points; make the heights of the perpendiculars, *Fig. 5*, to correspond to those taken from the plan, *Fig. 1*, as from K to e and d, &c. Through all the points draw curves, which will be the form of the mould, either for veneers to be glued in thickness or in the solid.

To find the Radial Bars.—Let M L, *Fig. 1*, be the seat of the radial bar. In M L take any number of points, a, b, c, d, e, and draw the perpendiculars M 1, e 2, d 3, &c., to L 7. Draw also M N a 1, e e b 2, c d c 3, &c., perpendicular to the base line of the Elevation, cutting the horizontal line N at the points N e d, &c., and cutting the convex side of the sash at the points a, b, c, &c., and the concave side at 1, 2, 3, &c., to 7; make the distances M 1, e 2, d 3, &c., respectively equal to N a 1, e b 2, d c 3, &c., and through the points 1, 2, 3, &c., draw a curve which will form the concave or inner edge of the radial bar; then make the breadth of the bar on each line respectively to correspond to the thickness of the sash frame on the plan.

Note.—The face-mould, *Fig. 1*, must be applied in the same manner as in groins, so that the sash head be bevelled by shifting the mould on each side, before applying the moulds, *Figs. 3 and 4*.

PLATE LXIII.—DETAILS.

DETAILS.—Showing the method of finding the moulds for constructing a semicircular arch over a window in a circular wall.

Figure 1. Elevation and Plan of Arch.—On the plan, No. 7, the jambs or bottom bed of the arch are drawn to the supposed thickness of the wall, checked and splayed, having also an architrave on the outside. From the reveal and different members of the architrave, raise perpendicular lines to the base of the Elevation A B C, No. 6; then from the centre B describe the archivault, and divide it by radiating lines into the number of parts required for the arch-stones; and from the vertical plane of the check and inside of the splay, raise the perpendicular lines r and S; from the centre B describe the dotted line from S to e, forming the check on the soffit. Then to find the dotted line from r, representing the inside of the splay, which is kept level with the check at the centre of the soffit, from S raise the perpendicular line S w, and from the centre B, with the radius B r, describe an arc intersecting the perpendicular S at w. From the intersection thus found, draw an angle line to the centre B; from the point O, where the joint line intersects the dotted line S, raise the perpendicular y u, and from the centre B, with the radius B u, describe the arc u 9, then from 9 raise a perpendicular to intersect the horizontal line from O at p, which gives a point in the curve required; and from the intersections on the other joint lines at m and k, the points l and n are found in like manner.

The dotted curve line 1, 2, 3, 4, represents the extreme depth of the arch-stones, which are checked, as shown on the plan, in order to admit the ashlar to the back of the architrave.

On the one half of the plan, No. 7, the transverse joints of the arch-stones are represented without having either check or splay—on the other half they are shown in their finished state.

Figure 2 is the development of the soffit of the arch, the one half being shown in its finished state, and the other half without the check and splay. To find the development of the soffit on the horizontal line C D, make the distances from C to 1 equal to the distance from *a* to *b*, on the intrados of the arch in *Fig. 1*, No. 6, and from 1 to 2, equal to *b* to *c*, and from 2 to 3, &c., equal to *c* to *d*, &c., thus making the line C D, from C to 7, equal to the intrados of the arch from *a* to *y*. Then draw the chord line A B, No. 7, parallel to the base of the elevation of the arch, and the line C D parallel to A B, at any convenient distance clear of the plan; making the distance between the parallel lines A B and C D, *Fig. 2*, equal to the distance between the lines A B and C D, No. 7. Then to the line C D, No. 7, from the different joint lines on the Elevation, draw perpendicular ordinates, and from the points C, 1, 2, 3, &c., *Fig. 2*, raise perpendicular ordinates, making the different divisions of the ordinates, *Fig. 2*, equal to their corresponding ordinates, No. 7, and through the points thus found trace the curved lines, which give the development of the intrados of the arch, before being moulded, checked, or splayed. Then to find the development of the check represented by the lines G H and I K, No. 7, raise a perpendicular line through the centre of the plan; and also through the centre of its development from H, draw a line parallel to A B or C D, terminating on the centre line at L. Then make the distance between T and the line A B, *Fig. 2*, equal to the distance from L to the chord line A B, No. 7; from T draw a line parallel to A B or C D, which is divided from T into parts equal to the divisions formed by the joint lines on the intrados of the check, as from *i* to *k*, *k* to *m*, &c., so that the distance from T to G will be equal to the half length of the intrados of the check, as from *i* to S; and from the points thus found on the line T G, draw perpendicular ordinates intersecting the check, as *h*, *k*, *p*, *r*, &c., making the different divisions of these ordinates equal to their corresponding ordinates from L H to I K, No. 7; and through the points *h* *p*, &c., and *k* *r*, &c., trace the curved lines *h* G and *k* K, which gives the development of the check; the ordinates also represent the joint lines.

The development of the splayed soffit is found in like manner, by dividing the line A B, *Fig. 2*, from the centre to B, into parts equal to the divisions of the arch-stones on the dotted line, representing the intrados of the arch on the inside of the wall, commencing at the centre, as from *i* to *l*, &c., to *r*, No. 6. From the points thus found on the line A B, *Fig. 2*, draw perpendicular ordinates, making the length of each equal to their corresponding ordinates, from the chord line A B to the inside of the wall, No. 7; and through the points *g*, *d*, *e*, *f*, D, *Fig. 2*, trace the curved line; also from these points draw the joint lines, as D G, &c.

The half extrados of the architrave is also found by the following method:—From the centre line, *Fig. 2*, divide the line C D into parts equal to the divisions of the arch-stones on the extrados of the architrave, No. 6; and from these points, 1, 2, 3, D, raise perpendicular ordinates, making each ordinate equal to the corresponding ordinate on the plan, No. 7; and through the points thus found trace the curved line *l* N, and *m* P, which represents the development of the extrados of the architrave.

Nos. 1, 2, 3, and 4, represent the different joints or bed moulds.

No. 1 is the upper bed of the jambs, and also the under bed of the first arch-stone.

No. 2 is the mould for the upper bed of the first arch-stone, and the under bed of the second; it is found by the following method:—From the joint line 2 *b*, No. 6, draw perpen-

dicular ordinates from the different members of the architrave, and also from the line of the check and splay, intersecting the plan, No. 7, at *a g*, and *b h*, &c.; draw horizontal lines from *a* to *b*, and from *g* to *h*, which shows the portion of the plan under the joint line. Then to find the extreme length and breadth of the bed, make A C, No. 2, equal to *b h*, and B D equal to *a g*, and A B and C D, each equal to the length of the joint line from 2 to *b*. On A B, make A 4 equal to *b f*, and 4, 5, equal to *f g*; from the points 4 and 5 draw perpendicular ordinates, making them equal to their corresponding ordinates from *a b*, No. 6; and through the points thus found, trace the curved line *a B*; then divide C D into parts equal to the divisions of the members of the architrave on the joint line 2 *b*; from the points C, 1, 2, 3, D, raise perpendicular ordinates, making each equal to their respective ordinates from *g h*; and through the points thus found, trace the curve line *b c*, and also the architrave mould.

No. 3 is the mould for the upper bed of the second arch-stone, and under bed of the third; this mould is found in like manner to No. 2, by drawing perpendicular ordinates from the different divisions of the architrave, check, and splay, on the joint line 3 *c*, to intersect the plan, then making A C, No. 3, equal to *d h*, B D equal to *c i*, and A B and C D each equal to the joint line 3 *c*, making the different divisions and ordinates respectively to correspond with those on the plan, as A 4, 5 B, equal to *c g* 7, 3, and C, 1, 2, 3, D, equal to the different parts of the architrave and wall.

No. 4 is the mould for the upper bed of the third arch-stone, and under bed of the fourth or key, which is formed as a truss, supporting the frieze; this mould is found, similar to the other, by drawing perpendicular ordinates from the different divisions of the architrave, check, and splay, on the joint line 4 *d*, intersecting the plan, and making A C, No. 4, equal to *e l*, No. 7, and B D equal to *f m*, and *c B* and *a D* each equal to 4 *d*; and from the different points, as *b*, 4, 5, B, and *a*, 1, 2, 3, D, draw perpendicular ordinates, making each respectively equal to their corresponding ordinates on the plan.

Note.—To apply the mould, make one of the beds, and square the ends of the stone to the extreme length required; apply the common head mould, 2 *b*, 4 *a*, No. 6, to both ends of the stone, which will give the other bed, also the extrados and intrados, before being checked and splayed, the concave surface of the reveal may be hollowed out with a curved bevel; after having the stone cut to this mould, apply the respective mould of the intrados, as shown on the development of the arch, which gives its obliquity.

N. B.—*This mould must be bent to the concave surface of the stone when tracing the lines.* Then apply the respective bed moulds, so as to coincide with the moulds of the intrados, which will give the oblique curves of the heads. The architraves and the check may be gauged between the moulds. The splay is moulded on the head by its respective moulds, as 1, 2, 5, 6, No. 6, always applying the moulds to coincide with the bed moulds.

DESIGN FOR A VILLA.

PLATE LXIV.

Fig. 1. Ground Plan.—The space marked A on the plan represents the *Dining-room*, 17 feet by 15 feet, exclusive of the window bay, 6 feet 8 inches by 2 feet 10 inches; height of ceiling, 10 feet.

B, *Parlour*, 15 feet by 13 feet 8 inches, exclusive of the window bay, 6 feet 8 inches by 2 feet 10 inches; height, 10 feet.

C, *Bed-room*, 12 feet by 10 feet 9 inches; height, 10 feet.

D, *Kitchen*, 14 feet by 13 feet; height, 10 feet.

E, *Closet*, 7 feet 10 inches by 6 feet; height, 10 feet.

F, *Pantry*, 6 feet 4 inches by 4 feet 4 inches; height, 10 feet.

G, *Water-closet*, 6 feet 3 inches by 4 feet; height, 10 feet.

H, *Staircase*, 8 feet 6 inches by 7 feet 7 inches; length of steps 3 feet 6 inches, rise nearly $6\frac{5}{8}$ inches, breadth of tread, $9\frac{1}{2}$ inches.

I, *Lobby*, 5 feet 4 inches by 4 feet 4 inches; height, 10 feet.

K, *Passage*, 11 feet by 4 feet 4 inches; height, 10 feet.

L, *Entrance-hall*, 12 feet by 6 feet 3 inches; height, 10 feet.

Figure 2. Chamber Floor.—The space marked A represents a *Bed-room*, 17 feet by 14 feet, with a small closet or bed adjoining; height of ceiling, 8 feet at the level.

B, *Dressing-room*, 7 feet 9 inches by 6 feet.

C, *Bed-room*, 16 feet 8 inches by 13 feet 8 inches; height, 8 feet.

D, *Dressing-room*, 9 feet 6 inches by 7 feet 9 inches.

E, *Servant's Bed-room*, 14 feet 6 inches by 12 feet 6 inches, exclusive of the beds; height, 8 feet.

F, *Closet*, 8 feet by 7 feet 9 inches, lighted from the roof.

G, *Store-closet*, 8 feet 8 inches by 4 feet 9 inches.

H, *Passage, or Stair-landing*, 12 feet 6 inches long by 4 feet 4 inches wide, lighted from the roof.

Figure 3. Front Elevation.—The extreme length of the Front Elevation, including the projections of buttresses, is 42 feet 6 inches; the height from the level of the ground to the top of the cornice is 16 feet 9 inches, to the ridge of the roof 26 feet 8 inches, to the ridge of the roofs over the dormer windows 22 feet 6 inches, and from the ground to the top of the chimney-stalks 32 feet.

The entrance, raised 1 foot 6 inches above the level of the ground, ascended by three steps, is 3 feet 9 inches wide by 7 feet high, from the top of the upper step to the under side of the transom between the door and fanlight, the transom being 5 inches thick, and the fanlight 11 inches high.

The oriel window on each side of the door is 6 feet 9 inches high; the central opening is 3 feet 9 inches wide, and each of the diagonal openings 1 foot wide in the clear of the reveals.

The Chamber floor windows are 14 feet 10 inches from the level of the ground; they are each 4 feet 10 inches high by 3 feet 4 inches wide in the clear.

Figure 4. Flank Elevation.—The whole extent of the Flank Elevation, including the oriel window, is 44 feet 8 inches. The height from the level of the ground to the ridge of the roofs of the dormer windows on the back wing is 22 feet, the other heights being similar to those in the Front Elevation.

The entrance, raised 1 foot 6 inches above the level of the ground, ascended by three steps, is 3 feet 6 inches wide by 7 feet high, from the top of the upper step to the under side of the transom between the door and faulight, the transom being 4 inches thick, and the faulight 1 foot high.

The windows on the Ground floor are each 6 feet 3 inches high by 3 feet wide in the clear of the reveals.

The Chamber floor windows in the back wing are each 4 feet 4 inches high by 2 feet 8 inches wide; and those in the gable end are each 1 foot 6 inches wide by 4 feet 6 inches high to the top of the soffit of the arch.

Figure 5. Section.—The section is cut through the centre of the front door, running on a straight line through the Entrance-hall L, and Passage K, where it diverges to the dotted line through the Kitchen D.

The section of the Entrance-hall L, shows the foot base, door, and plaster cornice; the foot base is 9 inches high; the door is 3 feet 3 inches wide by 7 feet 3 inches high; and the plaster cornice is 9 inches on the wall, by 8 inches on the ceiling.

The section of the Passage K, shows the foot base, door, part of the stair through the archway, and the plaster cornice; the foot base is 9 inches high; the door is 3 feet wide by 7 feet 3 inches high; the stair steps are 3 feet 6 inches long, height nearly $6\frac{5}{8}$ inches; the archway is 3 feet 6 inches wide, by 8 feet high to the centre of the soffit; the plaster cornice is 6 inches on the wall by 7 inches on the ceiling.

The section of the Kitchen D, shows the foot base, jambs, and window finishing; the foot base is 8 inches high; the fire-place jambs are 4 feet high in the clear; the large opening is 4 feet wide, and the small one for an oven 1 foot 10 inches; the window breast is 2 feet 7 inches high above the floor.

The section of the Chamber floor is cut on a line perpendicular to the section line on the Ground floor, passing through the bed in the Room A, Store-closet G, Passage H, and Bed-room E. The Chamber floor joists are 10 inches deep by $2\frac{1}{2}$ inches thick, placed 1 foot $3\frac{1}{2}$ inches apart. The foot base in the different apartments is 7 inches high; the doors are 6 feet 8 inches high; those in the Bed-room E, are 3 feet 6 inches wide; the one in the Passage H, and also the bed, are each 3 feet wide; the entrance to the stair is 3 feet 6 inches wide by 7 feet high.

The section of the Roof is cut on a line perpendicular with the other section lines, showing ceiling joists, rafters, baulks, and ridge-boards. The ceiling joists are 6 inches deep by 2 inches thick; rafters 8 inches deep at the bottom, and 7 inches at the top, by $2\frac{1}{4}$ inches thick; baulks 4 inches deep by $1\frac{3}{4}$ inch thick; ridge-board 1 foot deep by $1\frac{1}{2}$ inch thick.

LODGES AND ENTRANCE TO A MANSION.

PLATE LXV.

Figure 1. Ground Plan of the Piers and Gateways.—The whole extent over the extreme piers is 69 feet 4 inches; and the distance which the gateways recede back from the line of those piers is 11 feet 9 inches. The width of the central gate for carriages is 11 feet in the clear above the base; and each of the side gates is 4 feet 9 inches wide.

Figures 2 and 3 are the Ground Plans of the Lodges, which are both of the same form and dimensions. The space marked A on the plan, *Figure 2*, is the *Kitchen*, 13 feet 8 inches by 12 feet, exclusive of the window bay, 7 feet by 2 feet 10 inches; height of ceiling, 8 feet.

B, *Parlour*, 12 feet 3 inches by 10 feet 5 inches, exclusive of the window bay, 7 feet by 2 feet 10 inches; height, 8 feet.

C, *Bed-room*, 8 feet 9 inches by 7 feet, and 8 feet high.

D, *Porch*, 5 feet 6 inches square; height of ceiling, 7 feet 9 inches.

Figure 4. Elevation of the Gateways.—The height of the external piers is 10 feet from the level of the roadway to the top of the cornice, and to the top of the cope 11 feet 4 inches, by 2 feet 10 inches thick in the body; and the height of the centre piers is 10 feet to the top of the cornice, and 12 feet 6 inches to the top of the vase. The height of the curved parapet walls is 2 feet 9 inches, and the walls extending beyond the external piers are each 7 feet high. The height of the cast-iron gates and railings is 7 feet 6 inches from the level of the roadway.

Figure 5. Front Elevation.—The whole extent of this elevation, including the oriel window, is 30 feet. The height from the level of the ground to the eaves of the roof is 9 feet 4 inches, to the ridge of the roof 16 feet, to the ridge of the roof over the window to the left 14 feet, to the gable top of the porch 13 feet 6 inches, and from the ground to the top of the chimney-stalks, 20 feet 4 inches.

The entrance, raised 1 foot 1 inch above the level of the ground, and ascended by two steps, is 3 feet 6 inches wide by 7 feet 6 inches high to the top of the soffit of the arch.

The oriel windows are each 10 feet 4 inches high from the level of the ground to the top of the cornice, and 10 feet 10 inches high to the top of the blocking; the centre space is divided into two compartments by a mullion $5\frac{1}{2}$ inches thick, each compartment being 1 foot 6 inches wide; each of the diagonal openings is 1 foot wide by 5 feet 3 inches high to the top of the soffit of the arch.

Figure 6. Flank Elevation fronting the road, the whole extent of which is 25 feet 7 inches, including the projection of the oriel window; the different heights are similar to those described on the Front Elevation.

The window to the front is divided into three compartments by stone mullions $5\frac{1}{2}$ inches thick, each compartment being 1 foot $2\frac{1}{2}$ inches wide by 5 feet 3 inches high to the top of

the soffit of the arch, crowned by a tablet, which reaches 1 foot 3 inches below the top of the window; and the window to the back is divided into two compartments, each 1 foot $2\frac{1}{2}$ inches wide by 5 feet 3 inches high to the top of the soffit of the arch.

Figure 7. Section.—The section is cut through the Porch D, and Kitchen A, showing the foot base, doors, fire-place, and window finishing. The foot base is 7 inches high; the doors are 6 feet 9 inches high by 3 feet wide; the fire-place is 3 feet 6 inches wide by 3 feet 7 inches high in the clear; the window-breast is 2 feet 2 inches high above the floor.

The section of the roof is cut on a line perpendicular to the section line on the Ground floor, showing the ceiling joists, rafters, baulks, and ridge-board. The ceiling joists are 6 inches deep by 2 inches thick; rafters 6 inches at the bottom, and 5 inches at the top, by $2\frac{1}{4}$ inches thick; baulks 4 inches deep by $1\frac{3}{4}$ inch thick; ridge-board 1 foot deep by $1\frac{1}{2}$ inch thick; the ceiling joists over porch are 5 inches deep by 2 inches thick; rafters 5 inches deep by $2\frac{1}{4}$ inches thick.

Figure 8. Plan of Roof.—The drawing represents the Roof in its finished state, also the roofs over the oriel windows.

DESIGNS FOR A VILLA IN THE OLD SCOTCH STYLE.

PLATES LXVI.—LXVIII.

PLATE LXVI.—PLANS OF GROUND FLOOR AND CHAMBER FLOOR.

PLAN OF GROUND FLOOR.—The space marked A on the plan represents the *Drawing-room*, 16 feet 3 inches by 14 feet 3 inches, exclusive of the front window bay, 7 feet by 2 feet 3 inches, and the side window bay, 8 feet 3 inches by 4 feet 8 inches; height of ceiling, 11 feet.

B, *Dining-room*, 20 feet 3 inches by 15 feet 8 inches, exclusive of recess, 8 feet by 1 foot 6 inches; height of ceiling, 11 feet.

C, *China Closet or Store-room*, 6 feet by 3 feet 6 inches; height of ceiling, 11 feet.

D, *Kitchen*, 15 feet 8 inches by 13 feet; height of ceiling, 11 feet.

E, *Scullery*, 8 feet 9 inches by 7 feet 6 inches; height of ceiling, 11 feet.

F, *Servant's Bed-closet*, 8 feet 9 inches by 4 feet; height of ceiling, 11 feet.

G, *Porch*, 6 feet by 4 feet 9 inches; height of ceiling, 11 feet.

H, *Vestibule*, 15 feet by 7 feet 9 inches; height of ceiling, 11 feet.

I, *Circular Staircase*, 8 feet 6 inches diameter; height of ceiling, 22 feet; length of steps, 3 feet 8 inches; the rise of each step is $6\frac{3}{4}$ inches, and the breadth from 12 inches to 14 inches. Below the stair is a store pantry, about 6 feet by 4 feet, lighted and aired by a small window.

All the fire-places of the principal apartments are placed in the internal walls.

PLAN OF CHAMBER FLOOR.—The space marked K, represents the principal bed-chamber, 16 feet 3 inches by 14 feet 3 inches; height of ceiling, 9 feet 6 inches.

L, *Bed-chamber*, 15 feet 8 inches by 14 feet 3 inches; height of ceiling, 9 feet 6 inches.

M, *Bed-chamber*, 13 feet 3 inches by 11 feet 9 inches; height of ceiling, 9 feet 6 inches.

N, *Nursery*, 16 feet 3 inches by 15 feet 8 inches; height of ceiling, 9 feet 6 inches. This room, and the *Bed-chamber* L, are provided with wardrobe recesses in the walls.

O, *Small Bed-chamber*, or *Dressing-room*, 8 feet by 7 feet 9 inches; height of ceiling 9 feet 6 inches.

P, *Bath-room and Water-closet*, 7 feet by 4 feet 6 inches; height of ceiling, 8 feet.

Q, *Vestibule*, 12 feet by 6 feet 6 inches, lighted by a skylight from the roof.

All the rooms are provided with presses; the kitchen with store-presses, having airlets; and the scullery is furnished with a boiler and sink, and has also a back door.

PLATE LXVII.—FRONT ELEVATION AND FLANK ELEVATION.

FRONT ELEVATION.—The whole extent of the Front Elevation, including the projection of the oriel window, is 53 feet. The height from the level of the ground to the eaves of the roof is 20 feet 6 inches; to the ridges of the roofs over the dormer windows, respectively, 27 feet 3 inches, and 29 feet 6 inches; to the ridge of the principal roof, 31 feet; and to the tops of the chimney-stalks, 36 feet. The height of the circular staircase to the eaves of the roof is 28 feet, and to the top of the pinnacle terminating the conical slated roof, 49 feet.

The entrance to the porch is raised 1 foot 6 inches above the level of the ground.

The windows in the Ground floor are various in width, namely, 1 foot 6 inches, 2 feet 8 inches, 3 feet, and 3 feet 6 inches, by from 6 feet 6 inches to 8 feet in height; the sills being from 1 foot (as in the *Drawing-room*) to 2 feet 6 inches in height. The *Bed-chamber* floor windows are 6 feet in height, and about 2 feet 6 inches from the floor.

FLANK ELEVATION.—The whole extent of the Flank Elevation, from front to back, including the projection of the bay window at the end of the *Dining-room*, is 38 feet; the height of the gable over the small *Bed-room* marked O on the plan, is 30 feet. The gables of the Flank and Back Elevations are the same height as that in the Front Elevation.

PLATE LXVIII.—SECTION AND PLAN OF ROOF.

SECTION.—The section of the Ground floor on the line marked A B on the plans, is taken through the centre of the circular staircase, and across the vestibule, into and through the *Dining-room*, and shows the finishings of the end window of the *Dining-room*, the door of the *Drawing-room*, the door of the store-pantry under the stair, and the section of the steps of the staircase.

The section through the *Chamber Floor*, shows the construction of the joisting, of the rafters of the main roof, and of the turret, &c. The sleeper joists are $6\frac{1}{2}$ inches deep by $2\frac{1}{2}$ inches thick, and 1 foot 6 inches between centres.

The doors of the Ground floor are 7 feet high by from 2 feet 6 inches to 3 feet 3 inches wide. The doors of the *Bed-chamber* floor are 6 feet 8 inches high by 2 feet 9 inches wide.

The skirting of the principal rooms in the Ground floor is 9 inches high by 1 inch thick; and in the rooms on the Bed-chamber floor, it is 6 inches high by $\frac{3}{4}$ inch thick.

The chimney-pieces of the Drawing-room and Dining-room are each 4 feet 8 inches wide over the jambs by 4 feet 2 inches high to the top of the shelf; and may be constructed of marble or of wood. The chimney-pieces of the Bed-chamber floor are 4 feet 2 inches wide over the jambs by 3 feet 10 inches high to the top of the shelf.

The plaster cornices of the Dining-room and Drawing-room are 10 inches deep on the wall by 8 inches on the ceiling, and may be plain moulded, or have one or two enrichments of 3 inches deep. The cornices of the principal Bed-rooms are 8 inches on the wall by 6 inches on the ceiling; and for the other rooms, 6 inches on the wall by 4 inches on the ceiling.

The joists of the Bed-chamber floor are 10 inches deep by $2\frac{1}{2}$ inches thick, and 1 foot 6 inches between centres.

The rafters of the roof are $6\frac{1}{2}$ inches deep by 2 inches thick. The lesser rafters are $5\frac{1}{2}$ inches deep by 2 inches thick.

The ridge-board is 7 inches deep by $1\frac{1}{2}$ inch thick. The sarking is 9 inches broad and $\frac{3}{4}$ inch thick.

The standards for the lath and plaster partitions are $3\frac{1}{2}$ inches deep by 2 inches thick, and 1 foot 2 inches between centres, and are covered with best even-split Baltic lath.

PLAN OF ROOF.—The plan of the Roof is drawn to show it in its finished state. The roof light over the vestibule on the Bed-chamber floor is 2 feet square.

The rain water may be conveyed from the roof by pipes, into a large cistern placed in the ceiling of the bath-room, or carried to the ground by cast-iron pipes, $2\frac{1}{2}$ inches diameter, on the outside of the walls.

Vitrified stoneware pipes are to be provided for carrying off soil from the water-closet, and waste water from the bath-room and from the scullery, to be led from the junction of the lead soil-pipe to the outside of the walls, and thence to the common sewer or drain. These pipes to be 10 inches in diameter, with facet-socket and joint, and to have a syphon-trap of the same material, to keep down vermin.

PLATE LXIX.—GEOMETRICAL LINES FOR ROOFS.

GEOMETRICAL LINES FOR ROOFS.—*Fig. 1. To find the lengths and bevels of the timbers, in the construction of a hip roof.*—Let E D be the width of a rectangular roof, A E and B D being a part of each side; make A E and B D each equal to half the width E D; join A B; bisect A B in F; draw C F equal to the height of the roof, perpendicular to A B; join A C and B C, then A C and B C are the length of the principal rafters; join E F and D F; produce either diagonal, as D F to G; make F G equal to C F; join E G, then E G is the length of each hip.

Draw a line, *a b*, at any convenient distance from E, perpendicular to the seat E F of a hip, cutting A E and D E at *a* and *b*. From the intersection of *a b* and E F describe a circle tangent to E G, cutting E F at *c*; join *a c* and *c b*, and the angle *a c b* is the inclination of the planes which form the hip angle, or what is termed the backing of the hip.

In this figure the purlin is shown in two positions: the first is when the purlin lies level,

or having two sides parallel to the horizon; the square at L, and the bevel at *o*, will show how to draw the end of the purlin in this case; and the following method applies universally to all positions of the purlin.

To find the bevel of a purlin against the hip rafter.—Let the purlin be in any place of the rafters, as at I, and in its most common position, that is, to stand at right angles to the rafter; from the point *o*, as a centre, with any radius, describe a circle. Draw two lines, *k l* and *r u*, to touch the circle in *k* and *r*, parallel to B D; and at the points *n* and *s*, where the circle and two sides of the purlin intersect, draw two lines parallel to the former, cutting the diagonal in *m* and *t*, and draw *l m* and *t u* perpendicular to *m n* and *s t*, and join the points *l p* and *u p*; then M is the down bevel, and N the side bevel of the purlin; these two bevels, applied to the end of the purlin, and the purlin cut to them, will fit the side hip rafter. By turning the stock of the side bevel of the purlin at N, from *o p* round to the line *p v*, will give the side bevel of the jack rafters; and the bevel at C, that is, the top of the common rafter, is the down bevel.

Figure 2 exhibits another construction of a hip roof. As the angle A C B, formed by the sub-hips A C, B C, is generally a right angle, if the height of the roof be set off from the point C on the sub-hip lines A C and B C, to F and G, the lines A G and B F will give the lengths of the hips. The section of the purlin is here placed differently to what it is in the preceding figure, being placed obliquely to the upper edges of the common rafters. The method of finding the bevel of either of the two upper faces of the purlin against the hip rafter is as follows:—From the upper angular point of the purlin describe the arc of a circle, and continue the sectional lines of that side to meet the arc. From the point where the sectional line of the upper sides of the purlin intersects the arc, draw two lines parallel to the wall-plate, each meeting the sub-hip line. Draw tangents to the circular arc, each parallel also to the wall-plate. From the points where the parallel lines meet the sub-hip line, draw lines perpendicular to the wall-plate, to meet the tangent lines, keeping each respectively to its own side of the centre. From the highest point of the section of the purlin draw a line also parallel to the wall-plate, to meet the sub-hip line. From this point draw lines to meet the tangent lines at the intersection of the perpendicular lines; and these lines, and the perpendicular from the highest point of the section of the purlin, will be the bevels required.

The backing of the hips is found in the same manner as in the former figure. To find the angle made by the hip rafter and the common rafter, produce the line from D to E perpendicular to the wall-plate; let D E be equal to the length of the common rafter; join A E; then the angle A D E is the angle made by the common rafter and the hip rafter.

Figure 3. *To find the angles of a bevel-ended roof, and the length of the hips.*—Let A D and B C be the edges of the wall-plates upon the two parallel sides of the roof, and let A B be the edge of the wall-plate on the oblique end. Bisect A B in E, and draw E c parallel to the wall-plates. Make E c equal to A E or B E. Through the point c draw C D perpendicular to the wall-plates A D and B C, and join A c and B c, which gives the seat of the sub-hips.

In this construction, the seat of the sub-hips bisects the angles A B C and B A D of the building; for since E c is parallel to B C, and B c joins them, the alternate angles B c E

and $c B C$ are equal; but by construction, $E B$ is equal to $E c$, therefore the angle $c B E$ is equal to the angle $B c E$; and consequently the angle $c B E$ is equal to the angle $c B C$; hence it is evident the angle $E B C$ is bisected. In the same manner the seat of the sub-hip $A c$ bisects the angle $E A D$. Produce $E c$ to F , make $c F$, $c a$, $c b$ each equal to the height of the roof, draw the lines $C F$, $D F$, $B a$, and $A b$; then $C F$ and $D F$ are the lengths of the common rafters, and $B a$ and $A b$ the lengths of the hips. The down bevel of the purlin is shown in the angle $c L C$; this bevel, and also the backing of the hips, is found in the same manner as in the preceding figures. Produce $C D$ to H , and make $D H$ equal to $D F$, through H draw a line, $H I$, parallel to the wall-plate $A D$; then $A H I$ is the angle made by the ridge and the hip rafter.

Or thus:—On the line $A h$ describe the semicircle $h k A$; make $A k$ equal to $A f$, and join $h k$; then $k A h$ is the angle which the ridge line of the hip makes with the wall-plate, and $k h A$ is the angle which the ridge line of the hip makes with the common rafter.

Figure 4: To find the seat of the hip and common rafters of an irregular-sided roof.—Let $A B C D$ be the line of the wall-plates. Bisect all the four angles of the roof by the straight lines $A L$, $B E$, $C E$, $D L$, and through E draw $E g$ parallel to $A B$, cutting $A L$ in g ; and draw $E h$ parallel to $C D$, cutting $D L$ in h ; join $g h$; then $g h$ will be parallel to $A D$.

By this construction it is evident that the seat of the hips will bisect the different angles; for, should we imagine perpendiculars drawn from E to the three sides, the three straight lines thus drawn will be equal; and since $E g$ is parallel to $A B$, the perpendiculars drawn from the points E and g to the straight line $A B$ are equal; and, in like manner, since $E h$ is parallel to $C D$, the perpendiculars drawn from the points E and h to the straight line $C D$ are equal; therefore, the perpendiculars drawn from the point g to the straight line $A B$ are equal to the perpendicular from h to the line $C D$; and, since the perpendiculars from the point E to the straight lines $A B$, $B C$, and $C D$, are equal to the perpendiculars from the point g to the lines $A B$ and $A D$, and also to the perpendiculars from the point h to the lines $A D$ and $C D$; therefore, as the line of the ridge $E g$ is parallel to the line of the wall-plate $A B$, $E h$ parallel to $C D$, and h parallel to $A D$, the different inclined planes which form the sides of the roof will have an equal inclination to the horizon, by making the angle $g E h$ level.

To find the lengths of the different hip and common rafters.—From the points g and h , on the seat of the common rafter $F G$, raise the perpendiculars $g e$ and $h f$ equal to the height of the roof, join $e F$ and $f G$, which are the lengths required; and from the point E , on the seat of the common rafters $H I$, raise the perpendiculars $E c$ equal to the height of the roof; join $c H$ and $c I$, which will be the length of the common rafter at this place; and from the seat of the hips $A g$, $B E$, $C E$, and $D h$, raise the perpendiculars $g a$, $E a$, $E b$, and $h d$, making each of these perpendiculars equal to the height of the roof; then join $A a$, $B a$, $C b$, and $D d$, which will be the respective lengths of the hip rafters.

Figures 5 and 6 exhibit two methods of joining timbers by two tables and a key, being also strapped on the upper and under side, and bolted through. Scarfs of this kind are very strong when properly executed.

Figure 7 exhibits two methods of framing joists into a girder, with the form of the mortises and tenons.

PLATE LXX.—ROOFS.

ROOFS.—*Figure 1* is a design for a roof, with a tie-beam at the foot, and a collar-beam; also a brace from the top of the rafters, properly nailed to the collar-beam and tie-beam. In this example the tie-beam is in a state of tension, which, of course, with its own weight, has a tendency to bend it down from the straight line, which the brace from the top of the rafters is intended to prevent; the collar-beam is merely employed in keeping out the rafters, and is therefore, in a state of compression. This roof may be used where the span is from 20 to 30 feet.

Figure 2 is an example of one of the simplest kinds of bound roofs, having a tie-beam, king-post, and two struts, without any iron straps, the tie-beam being hung from the king-post by a joining bolt.

Figure 3 is an example of a roof with a platform on the top, and the common rafters in a horizontal direction.

Figure 4 is an example of a roof with purlins. This truss may be employed in a span extending from 70 to 80 feet, or even more, depending on the strength of the timbers.

Figure 5.—Example of a church roof, supported on cast-iron columns, with an elliptical ceiling in the central space.

Figure 6 is another design for a truss, where a coved ceiling is required. In the construction of trusses of this description, great precaution is necessary, both in the arrangement of the timbers and the uniting of them together, in order to prevent, as far as possible, the lateral pressure from acting on the walls—an evil which can never be so effectually avoided in roofs of this kind as in those where a level tie-beam is employed.

It is intended that the circular struts abutting between the angular ties and the principal rafters be of straight-grained wood, 4 inches thick, and the breadth of the ties and rafters bent into their arched form, so as to throw the weight of the roof off the angle tie-beams.

PLATE LXXI.—DOMES.

DOMES.—*Figure 1.*—No. 1 is the elevation of a dome, or circular-ribbed roof, with a purlin introduced to support the jack-ribs, in order to divide the spaces as equally as possible. In large roofs, constructed of a domical form without trussing, the ribs may be made of thin wood in two or more thicknesses, in such a manner that the joint of every two pieces in the same rib may fall as distant as possible from the joint of any other two pieces in a different rib. The number of purlins will depend upon the diameter of the dome.

No. 2 is the plan of one half of the dome; the space in the centre is intended for a lantern or cupola light.

No. 3, one of the ribs, showing also the purlin and curb. The space below the purlin shows one of the jack-ribs.

The upper ends of the ribs terminate upon the curb and purlin, with a *bird's mouth* joint, which is the usual method of joining them together.

Figure 2.—No. 1 is the elevation of a dome on another method, where the bays are filled

in with strutting pieces; the curvature of the horizontal struts is the same as the curvature of the ribs, in consequence of their sides being in planes passing through the centre of the sphere.

No. 2 is the plan, also intended for a lantern or cupola light in the centre.

Figure 3.—No. 1 is a section cut through the centre of a spherical dome built with stone. The moulds marked 1, 2, 3, 4, &c., to 10, are those which apply to the convex surface on the horizontal joint; the lines $a k, b l, c m, d n$, &c., being at right angles to the different radii $C k, C l, C m, C n$, &c., produced until they intersect the perpendicular $a C$, the different intersections being the centres, which give the circular leg of the mould, and the straight lines drawn at right angles to $a C$, those which give the straight or horizontal leg. The mould marked 11 applies to the concave surface on the horizontal joint; the other concave moulds may be found in like manner, as from F to E , on the perpendicular $a C$. On the radius $C D$ is shown the general arch mould.

No. 4 is the mould applied on the spherical surface to the vertical joints. Let $a b c$ be a radius equal to the radii $C A$ or $C B$ (in No. 1), and make $b c$ equal to the depth of the archstones; from the centre a describe the circular lines b and c to the length of the stone—then will the space contained between the different radii be the vertical mould, as the joints in all cases tend to the centre of the dome.

No. 2 is one half of the plan; the dotted lines represent the joints on the concave surface, and the solid lines the joints on the convex surface of the dome.

Figure 4 shows the method of covering a dome or circular roof, with the boards horizontally, as would be the case in *Figure 1*. By this method, it is evident that, if a spheric body be cut by two planes, each parallel to the base, the portion of the surface of the sphere between these planes will nearly coincide with a conic surface, contained between sections perpendicular to the axis of the cone, each being of the same diameter as those made by cutting the conic solid; therefore, the whole of the spheric solid may be formed into so many conic frustums, lying one upon another; so that covering all the conic frustums will also cover the spheric solid, by adding to each board the difference that is between its conic plane and its spheric.

To find the centres for describing the covering of each conic surface, produce the sections of these surfaces, until they meet the axis of the dome or circular roof. According to this method, let $B A D$ be the section of a circular dome, and let $C l$ represent the axis. Inscribe the chords $a b, b c, c d, d e$, &c., each equal to the width of a board. Produce $b a$ to meet the axis in S . From S , with the radii $S a, S b$, describe the arcs from a and b , which are the edges of the second board. Produce $c b$ to meet the axis in T . From T , with the radii $T b, T c$, describe the arcs from b and c , which will form the edges of the third board, and so on.

Figure 5 shows another method of covering a dome or circular roof, that is to suppose the circumference of the base divided into any number of equal parts corresponding with the breadths of the boards, and the sphere to be cut by planes passing through the points of division, and through the fixed axis; thereby the surface of the sphere will be divided into as many equal and similar parts; so that if any of these portions of the sphere be covered, the same cover will, of course, fit any other portion thus divided.

It will be observed that in this, as well as in the former case, the surface of each part is spherical or convex, and therefore can neither be considered as the frustum of a cone nor

that of a cylinder; but should the distance between the points of division be small, the surfaces will be nearly straight in all the axial sections, so that there will be no practical difference, even though ordinary wide boards be used.

According to this method, suppose $A B C$ to be the vertical section of one half of a semi-circular dome, $B C$ being one half of the base, and $A C$ the perpendicular axis; and as the dome is semicircular, the semi-section $A B$ (No. 5), will coincide with the circumference of the plan $D E$. Divide the curve $A B$ of the rib into any number of equal parts, and extend the curve $A B$ upon the straight line $A B$, No. 5; that is, make the straight line $A B$ (No. 5), equal in length to the curved line $A B$ (in *Fig. 5*). Through the points of division 1, 2, 3, 4, &c., in the curve $A B$, draw lines perpendicular to $B C$, cutting it at the points 5, 6, 7, 8, &c., then, extending the parts of the arc between the points of division upon the line $A B$ (No. 5), from B to 1, from 1 to 2, from 2 to 3, from 3 to 4, &c., make $B D$ or $B E$ each equal to the half breadth of a board, and join $D C$ and $E C$. Through the points 1, 2, 3, 4, &c., in $A B$ (No. 5), draw perpendiculars, 1 a , 2 b , 3 c , 4 d , &c.; make 1 a , 2 b , 3 c , 4 d , &c., respectively equal to 8 d , 7 c , 6 b , 5 a , &c.; then through the points B , a , b , c , d , &c., draw a curve, which will form one edge of the board, the other edge being similar.

PLATE LXXII.—CORNICE AND PENDENTIVE BRACKETING.

CORNICE AND PENDENTIVE BRACKETING.—*Figure 1 shows the construction of cove-bracketing, so as to find the angle brackets both for internal and external angles.*

As the coves and cornices of rooms are generally formed of plaster, when they are large the plaster is supported upon laths, fastened to brackets, coinciding with the outline of the cove or cornice; these brackets are fixed into the angle formed by the wall and ceiling of the room, placed at proper distances for supporting the lath; and in order to support the laths at the mitres, brackets are also fixed in the angles. Let $a d b$, *Figure 1*, be part of the section of a room; $b d$ is the ceiling line, $a d$ the wall line, and $a b$ the line of the cove-bracket, which stands at right angles to the face of the wall. To find an internal mitre bracket of a right angle, draw $A D$ perpendicular to $d A$, and from $b d$, the projection of the cove, draw $b B$ parallel to $d A$, and $B E$ parallel to $A D$; then at equal distance to $d b$, join $A B$, which is the seat of the angle bracket. In the arc $a b$ take any number of equal points, e, f , &c., and from these points draw lines parallel to $a d$; that is, perpendicular to $d b$, cutting both $d b$ and $A B$ in as many points; from the points of intersection in $A B$, as h, i , &c., draw lines perpendicular to $A B$, and make the lengths of the perpendiculars respectively equal to those contained between the ceiling line $b d$ and the curve line $a b$; as $A C$ equal to $a d$, $h k$ equal to $e c$, and $i l$ equal to $f g$, &c.; and through the points C, k, l, B draw a curve; and the curve thus drawn will form the cove in the angle required. The line $D E$ represents the seat of the mitre bracket for an external obtuse angle; this bracket is found, similar to the former, by raising $D o, m p, n r$, &c., perpendicular to $D E$, and making the lengths of the different perpendiculars, from $D E$ respectively, equal to those from $A B$, and $d b$; then through the points $o p r$, &c., draw a curve, which will form the cove in the angle required.

Figure 2 exhibits the section of a large cornice, where the bracket is shown within the

outline of it. To find the bracket for an internal mitre of a right angle:—Suppose $f o$ to be the line of the wall, and $e f$, the line of the ceiling; produce $f o$ to A perpendicular to $e f$, and draw $e B$ parallel to $f A$; then draw $A D$ perpendicular to $A f$, and $B E$ perpendicular to $e B$: at a distance from $A D$, equal to the ceiling line from e to f , join $A B$, which will be the seat of the angle bracket: draw $A C$ perpendicular to $A B$, to a length equal to the line $f o$; produce the line $b g$ to $A B$, also $c d$ to $A B$, and from the points of intersection raise perpendiculars respectively equal to those contained between the ceiling line $e f$, and the line of bracket $o b c d e$; then join the different points respectively, and the line of the angle bracket is obtained. The line $D E$ represents the seat of a mitre bracket in an external obtuse angle; this bracket is found, similar to the former, by drawing lines parallel to $A D$ or $B E$, from the different points of intersection on the line $A B$, as $h n$, &c.; then raising perpendiculars from the line $D E$, as $D o$, $n l$, &c., making each respectively equal to those from $A B$ or $e f$; the different points being joined, give the line of the bracket required.

Figures 3, 4, and 5, are examples of Pendentive Bracketing.—PENDENTIVE BRACKETING occurs when portions of a concave or straight surface are carried from the sides of a rectangular or polygonal room to a level circular ceiling. The portions of the ceiling thus introduced between the walls and the level ceiling or dome are called pendentives. Hence, pendentives are either spherical, spheroidal, or conical, being portions of a spheric or conical surface, contained by three circles of the sphere or cone, so that the planes of two of the circles may be tangents to the circumference, and perpendicular to the plane of the third circle; therefore a pendentive is bounded on all sides by curved lines, two of which are in vertical planes, and one horizontal. The form of the vertical arch on the walls, from which the sphere or cone springs, depends entirely upon the following principles:—If a sphere be cut by a plane, the section will be a circle; and if a hemisphere be cut by a plane perpendicular to its base, the section will be a semicircle. If a right cone be cut by a plane perpendicular to its base, the section will be an hyperbola; therefore, if, on the base of a hemisphere or cone, we inscribe a square or polygon within the containing circle, and cut the solid by planes perpendicular to the base through each of the sides of the square or polygon, the sections will represent the portions of each wall, and the arcs will represent the springing line for the spherical or conical surfaces. Hence, should the springing lines upon the walls be semicircular, the pendentives will be portions of a hemisphere, having the angular points in a great circle passing horizontally through the centre; should the springing lines be segments of a circle, the portion of the sphere forming the pendentives will be segments less than a hemisphere; or, should the springing lines be hyperbolical, the pendentives will be portions of a cone.

Figure 3.—No. 1 is the plan of a room, with the ribs which form the pendentive ceiling. The plan $A B D C$ is the square of the room, inscribed in the hemispheric base. The semicircular arcs on the sides, of which the diameters are equal to the side of the square forming the plan, are supposed to turn up perpendicular to the plan, forming the springing lines, also the terminations of the walls. No. 2 is the section and elevation of the concave side, made by a plane parallel to one of its sides.

Nos. 3, 4, 5, and 6, exhibit the ribs for one-half of one of the sides; and as these ribs are all in planes passing through the axis, they will all be portions of the sphere, of which

the diagonals of the square is a diameter; consequently, half this diameter is the radius of the ribs. To find the length of the ribs, suppose the interior circle on the plan to represent the curb. From the intersection of the diagonals on the plan as a centre, describe arcs from the seats of the different ribs on the line A B, as A *a*, and also through this centre draw lines at right angles to the sides, passing through the centre of each side of the plan: from the points where the arcs from the seats of the different ribs intersect the perpendicular line on the centre of the side A B, draw the lines *b c* and *e d* parallel to A B; also, from the interior circles or curb lines on the plan, draw the parallel lines *i* and *f*; then, with a radius equal to half the diagonal line, draw the arc *b i*, which will be the concave side of all the ribs. The concentric outer circle may be at any distance, according to the breadth of the rib; and as the other ribs are all portions of the same circle, their lengths may be found by describing arcs from their different seats on the side A B, so as to intersect the perpendicular line on the centre of that side; from thence draw lines parallel to A B, cutting the given rib at the lengths required: they may be shown separately, either by extending the parallel lines, or by raising perpendiculars from the points where they cut the given rib, keeping the section of the curb also perpendicular, as shown on the drawing.

Figure 4.—No. 1 is one-half of the plan of a room, with the ribs which form the pendentive ceiling placed on a conic surface. No. 2 is the elevation.

Figure 5 shows the method of describing the springing lines on the walls, the ribs over the diagonal of the plan being given agreeably to the plan and elevation, *Figure 4*. The square A B D C represents the plan of the room, and the ribs over the diagonal of the square are A *b*, D *c*. From the centre *a*, with a radius equal to the half of the square, describe the arc *d h*, and from the point where the arc thus described cuts the diagonal A D, draw *h r t* perpendicular to A D, cutting the rib at *r t*: suppose the plan of the curb, and also the ribs from *Figure 4*, No. 1; and since these ribs are similar to those in every other eighth part of the plan, their formation will be sufficient for the whole. The plan of the ribs is found by dividing any arc described, from the centre *a*, into the same number of equal parts as there are ribs required; through these divisions on the arc, draw lines from the centre, to terminate upon the side of the square: from the seat of the ribs on the line A C, raise lines perpendicular to A C, making the division of the perpendicular lines equal on both sides from the centre of the line A C. Should the divisions be too wide for tracing the curved line, additional perpendicular ordinates may be drawn at any convenient place on the line A C, as *g* 4. From the centre *a*, with the radii *a e*, *a f*, *a g*, describe the arcs *e i*, *f l*, *g n*, each terminating on the diagonal A D; and from the points where these arcs intersect the diagonal A D, raise lines perpendicular to A D, cutting the rib A *b* at *g*, *m*, and *n*: make the ordinates 1 *d*, 2 *e*, 3 *f*, 4 *g*, each respectively equal to *h r*, *i g*, *l m*, *n o*, then the curve 1 2 3 4 being drawn, will be half of the springing line over A C; the other half, being made similar, will be the whole of the springing line upon each of the four walls. The lengths of the different ribs are also shown by the perpendiculars *h r*, *i g*, *l m*. The elevation or angular section, No. 2, is cut on the line A D E C, No. 1, *a B* being the angle rib represented on the section at *b h*. The springing lines on the walls are found by making the perpendicular ordinates from the spring of the different ribs each respectively equal to their corresponding ordinates on the plan, *Figure 5*.

PLATE LXXIII.—STAIRS.

STAIRS.—*Figure 1, No. 1*, is the plan of a GEOMETRICAL STAIRCASE, consisting of a series of flyers between two quarters of winders. This stair is represented as being constructed of wood; the treads of the two upper steps are supposed to be removed, so as to show the method of joining the brackets into the risers. *Figure 1, No. 2*, is the elevation and also the section of the first flight on the two upper steps; the method of joining the brackets into the risers is likewise shown. *Figure 2, No. 1*, is the plan of a GEOMETRICAL STAIRCASE, with winders, showing the areas of the steps; and *Figure 2, No. 2*, is the elevation and also the section of the first flight, showing both the height and breadth of the steps, and the proper turnings of the rail. The stair is represented as being constructed of stone, but as there is no difference in the delineation of a stone stair from a wooden one, the drawings will serve for either.

PLATE LXXIV.—MOULDINGS.

MOULDINGS.—The different forms of mouldings, and also the ornaments with which they are enriched, may be said to admit of an endless variety, although of regular mouldings there are but eight, the names of which are, the *Fillet*, *Torus*, *Astragal* or *Bead*, *Cyma Recta*, *Cavetto* or *Hollow*, *Ovolo* or *Quarto Round*, *Cyma Reversa* or *Talon*, and the *Scotia*. The names given to these mouldings are indicative of their forms, and the selection of any of them should be determined by judging of the form best adapted to the use for which they are intended. The *Fillet* is used to separate, contrast, or strengthen the effect of other mouldings. The *Torus* and *Astragal* are intended to bind or support the parts on which they are employed. The *Cyma Recta* and *Cavetto* to cover or shelter other members, as, from the concavity of their outline, water cannot glide along their surface, but must necessarily drop from it. The *Ovolo* and *Cyma Reversa*, being strong at their extremities are best adapted for bed mouldings or supports; and the *Scotia* is generally used in bases, where it always has the effect of preventing that confusion which would be occasioned by joining several convex members together. The drawing marked A is an *Ovolo* and *Bead*, enriched with oves, or egg and tongue. B, *Quarto Round*, enriched with oves and darts. C and D, *Ovoles*, enriched with oves and husks. E, F, G, and H, *Cyma Reversas*, differently enriched, E and F having beads attached to them. I, *Ovolo*, enriched with scroll ornament. K, *Cyma Recta*. L, *Torus* or *Bead*.

PLATE LXXV.—FRIEZES.

FRIEZES.—The frieze is that portion of the entablature which separates the architrave from the cornice; although, in plaster work, it is often used below cornices without the architrave. The drawings marked A A are after the Gothic style; B, Elizabethan; C, Foliage; D, Guillochi and Rosettes; E E, Frets.

PLATE LXXVI.—CORNICES.

CORNICES intended for plaster work.—The drawing marked A represents a cornice, enriched with baskets of flowers and fruit, and shells and foliage. B and C are impost cornices. D is enriched with vine ornament. E and F are cornices after the Gothic style, and G after the Elizabethan.

PLATE LXXVII.—BRACKETS.

BRACKETS, or Consoles for supporting a cornice, bust, vase, or other ornament. The drawings marked A, B, C, D, and E, are specimens of brackets after the Elizabethan style; the drawing marked C is a side view of B, and D is the plan of the same. F and K are brackets or corbels after the Gothic style. The drawing marked H is a side view of the brackets marked G, and M a side view of the bracket or truss marked L.

PLATES LXXVIII—LXXIX.—BOSSES.

PLATE LXXVIII.—BOSSES, or ties for the intersections of groins.—The drawing marked B is a side view and section of the plan A; D of the plan C; F of the plan E; H of the plan G; L of the plan K; and N of the plan M.

PLATE LXXIX.—BOSSES, or ceiling ornaments.—The drawings marked A A represent one-half of the plan, and a section of the same ornament; B, plan of a small ornament; C C, plan and section of a large one; D, plan; E E, plan and section; F, plan; G G, plan and section.

PLATES LXXX—LXXXI.—PLANS OF CEILINGS.

PLATE LXXX.—PLAN OF CEILING, panelled with mouldings raised on the surface of the ceiling, the stiles being raised only about three-fourths of an inch above the panels.

PLATE LXXXI.—The section of this ceiling is shown by a dotted line on the plan.

PLATES LXXXII—LXXXIII.—CHIMNEY-PIECES.

PLATE LXXXII.—CHIMNEY-PIECES.—The drawing marked A represents the elevation of a chimney-piece after the Gothic style; B, a side view; C C, the plan of the jambs; D, moulding under shelf; E, impost moulding; and F, moulding of quatrefoil panel. The drawing marked G represents the elevation of another chimney-piece; H, a side view; K K, the plan of the jambs; L, moulding under shelf; M, impost moulding; and N, base moulding. Those chimney-pieces are shown on the plans as being constructed of wood, but they are equally well adapted for stone.

PLATE LXXXIII.—CHIMNEY-PIECES.—The drawing marked A represents the elevation of a chimney-piece; B, a side view; and C C, the plan of the jambs. The drawing marked D represents the elevation of another chimney-piece; E, the plan of the shelf; and F F, the plan of the jambs.

PLATE LXXXIV.—VASES.

VASES are very appropriate ornaments in the light and ornate styles of architecture; and when judiciously introduced, of suitable size and form, and in harmony with the style of architecture, they add much to the beauty and finish of the building. The vases figured in the plate are a selection of forms considered best adapted to the different uses for which these elegant ornaments are required.



ELEVATION AND GROUND PLAN

PLATE II

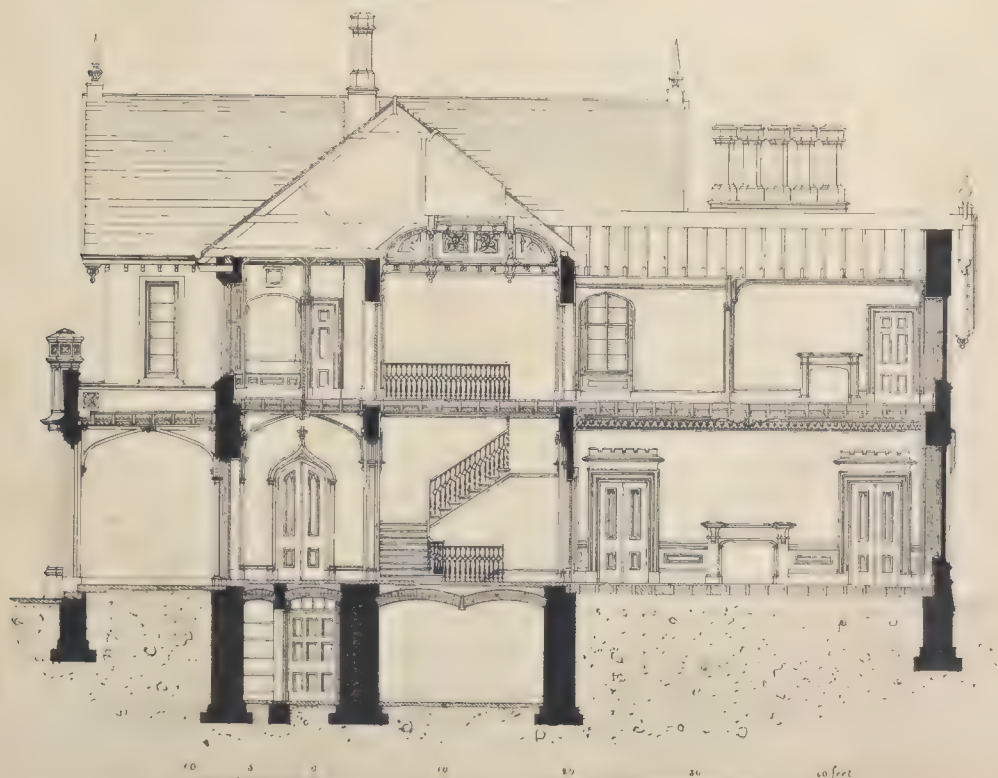
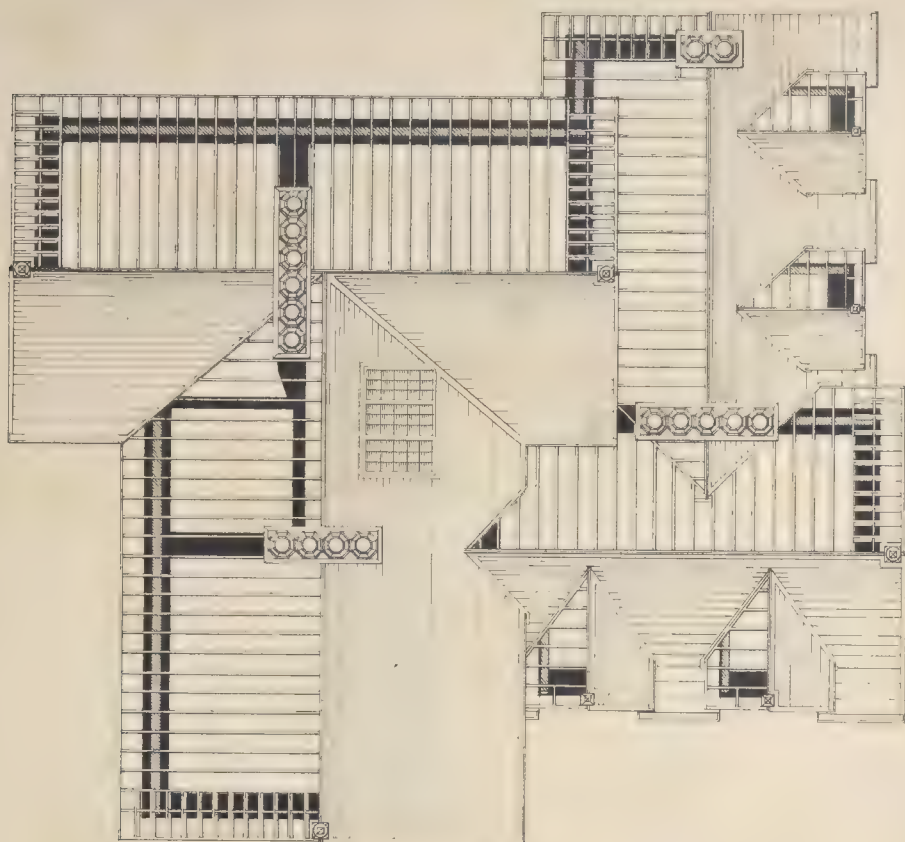


0 5 10 20 30 40 feet

ELEVATION AND PLAN OF CHAMBER FLOOR *PLATE III.*

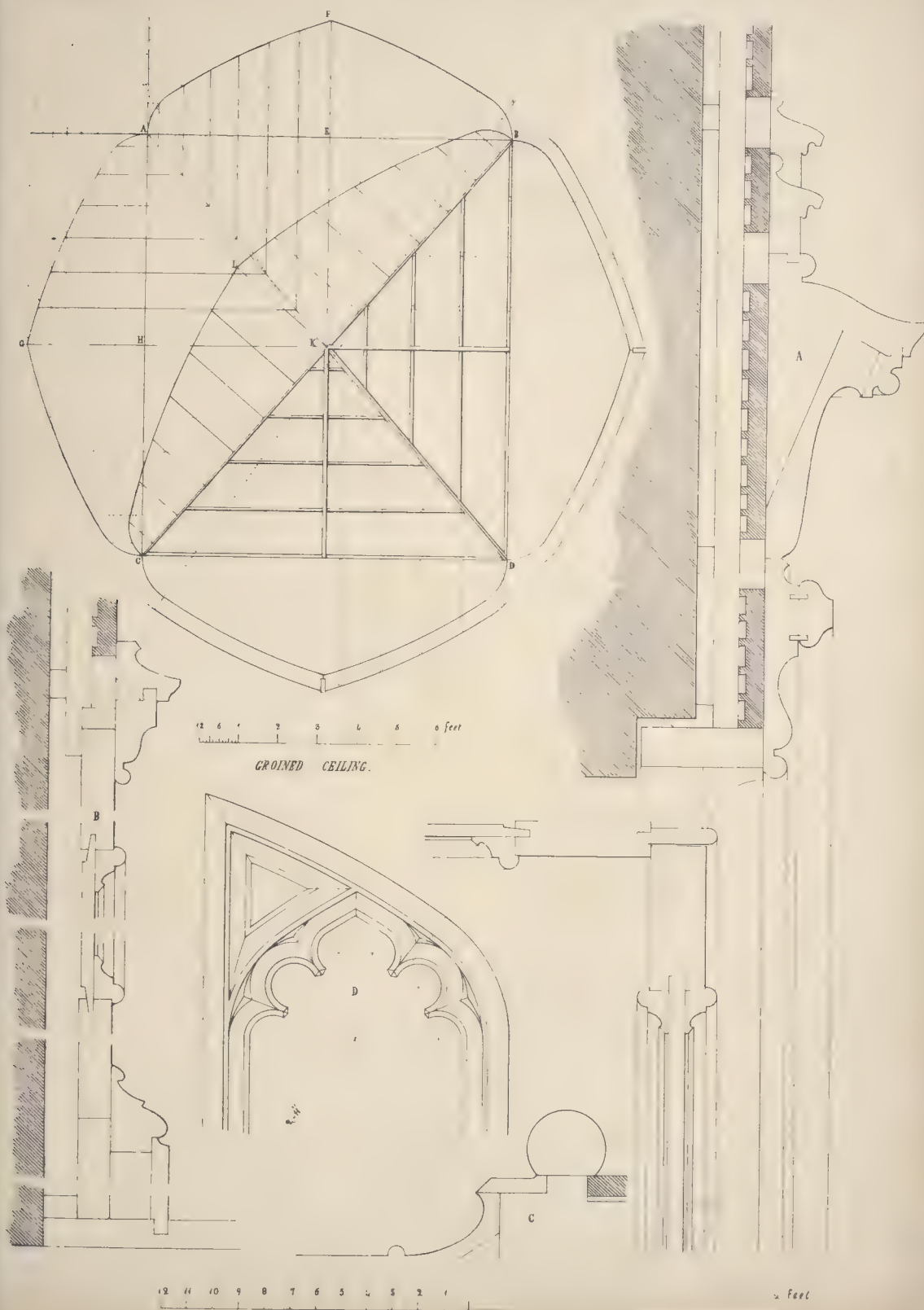


10 3 10 20 30 40 feet









DESIGNS FOR TWO COTTAGES

PLATE VIII.

Fig. 3.

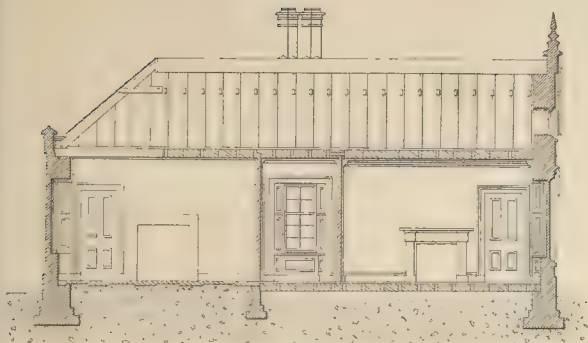


Fig. 6.

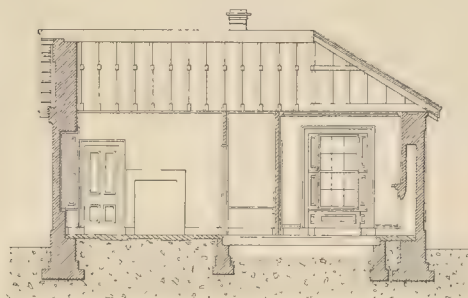


Fig. 2.



Fig. 5.

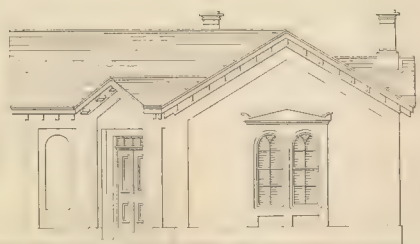


Fig. 1.



Fig. 4.



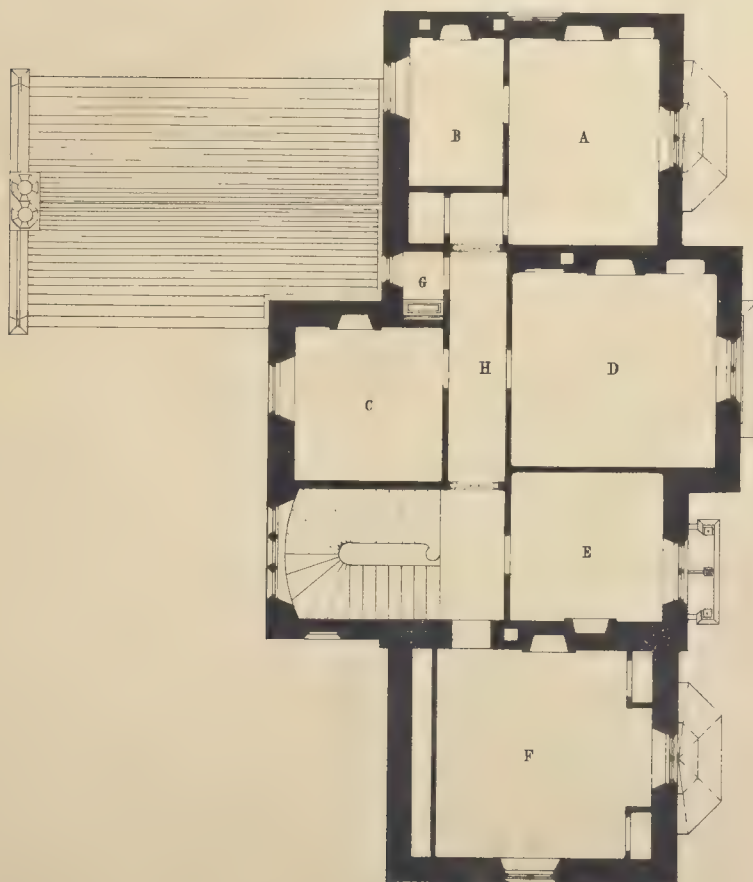
10 5 0 10 20 30 feet

GROUND PLAN AND FRONT ELEVATION.



10 9 8 7 6 5 4 3 2 1 10 20 30 40 Feet

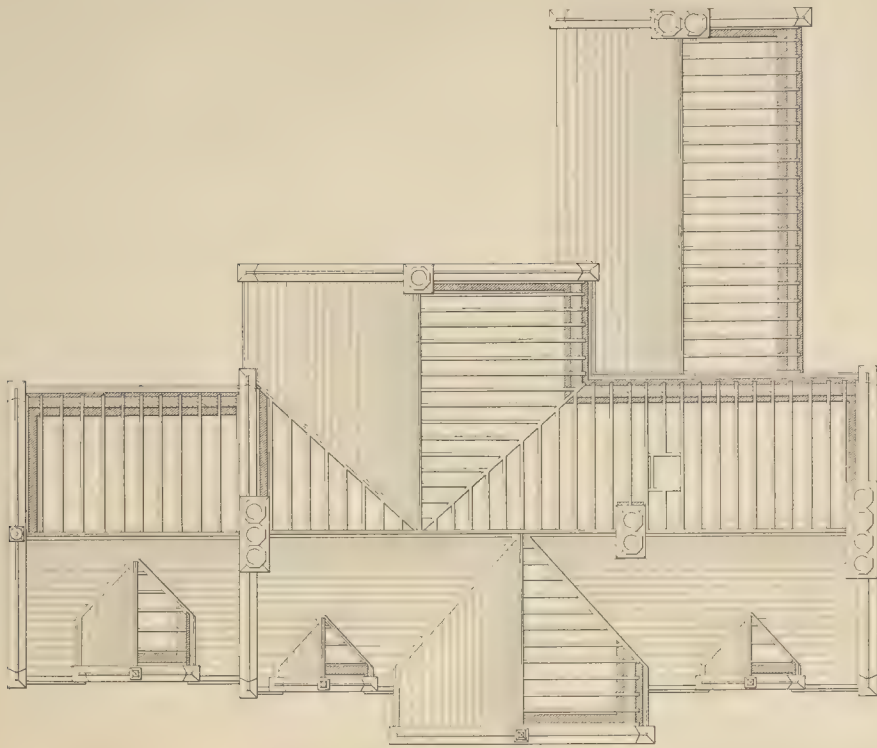
CHAMBER FLOOR AND END ELEVATION. *PLATE X.*



0 10 20 30 40 50 60 feet

SECTION AND PLAN OF ROOF.

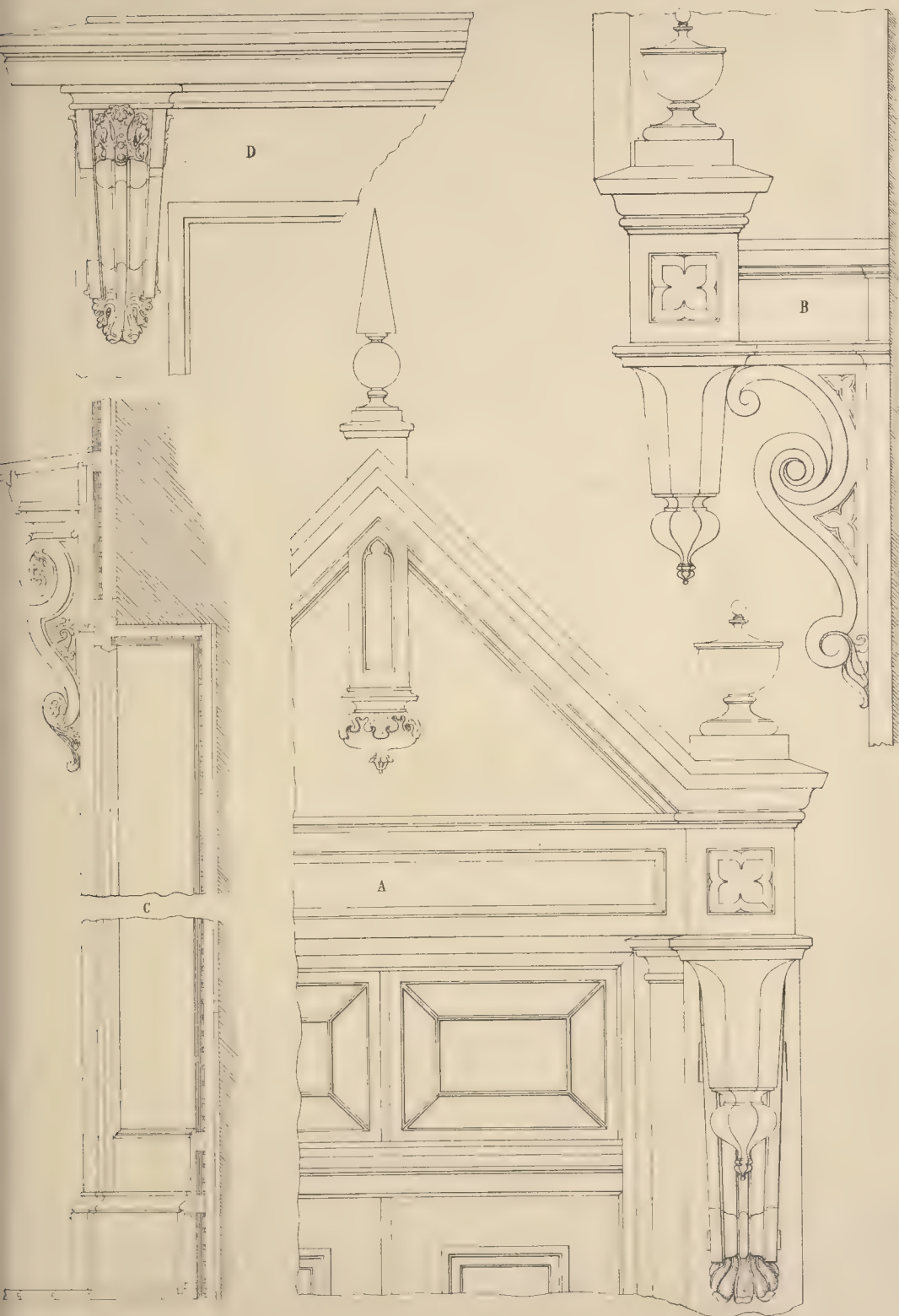
PLATE XI



DETAILS OF FRONT DOOR-WAY

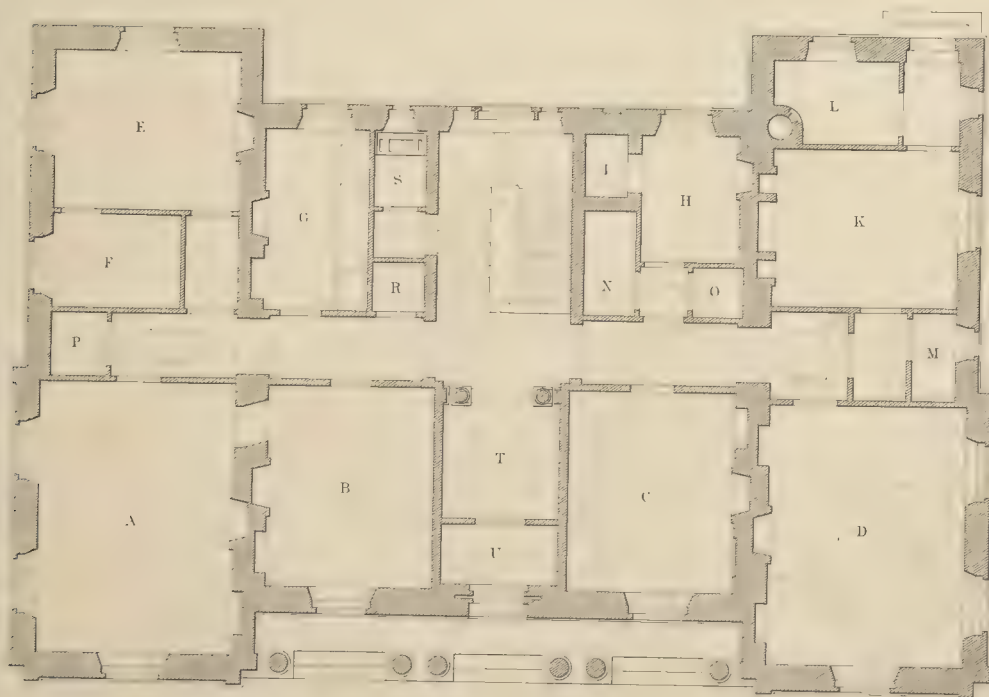
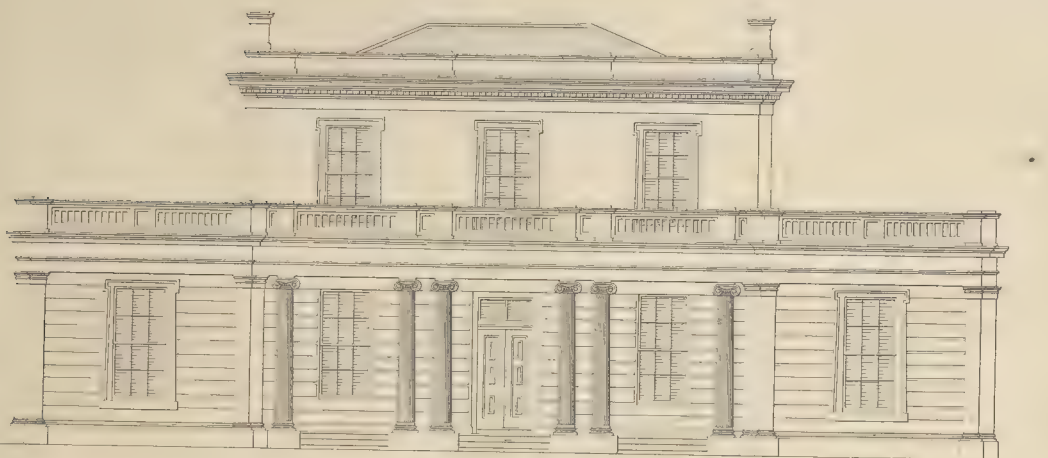
PLATE XII.

AND RECESS IN DINING-ROOM.



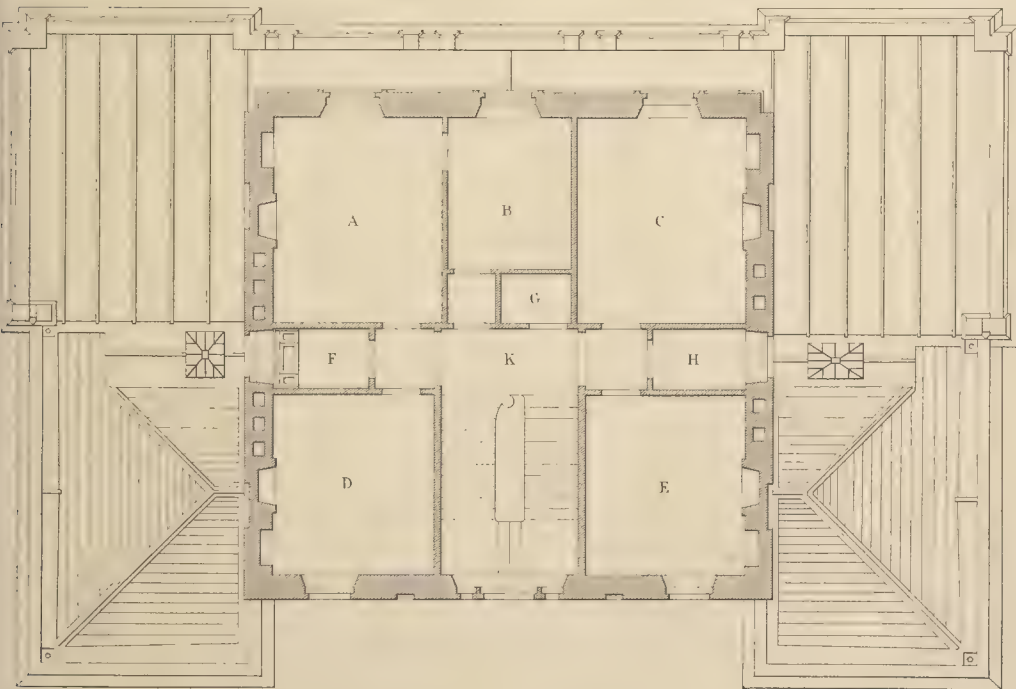
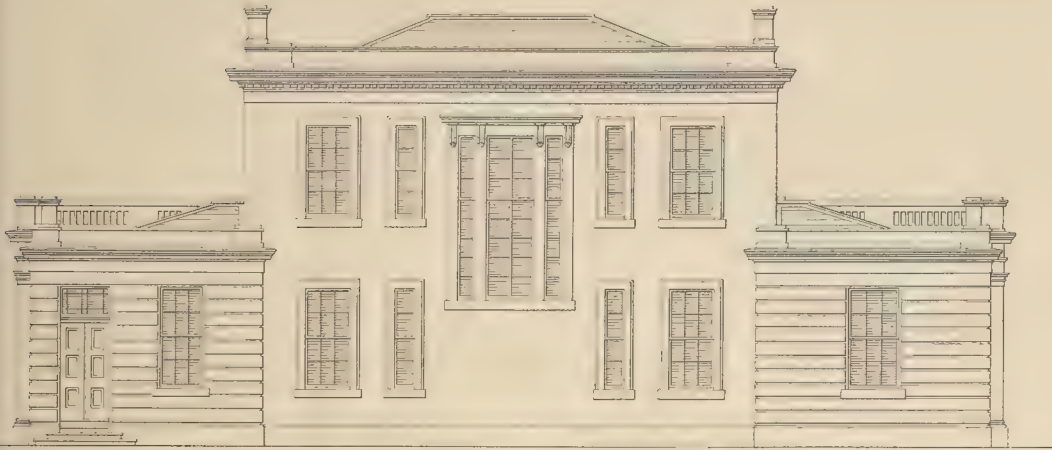
5 feet

GROUND PLAN AND FRONT ELEVATION.



10 5 0 10 20 30 40 50 feet

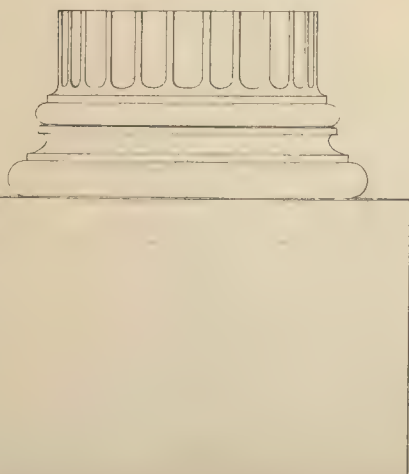
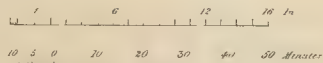
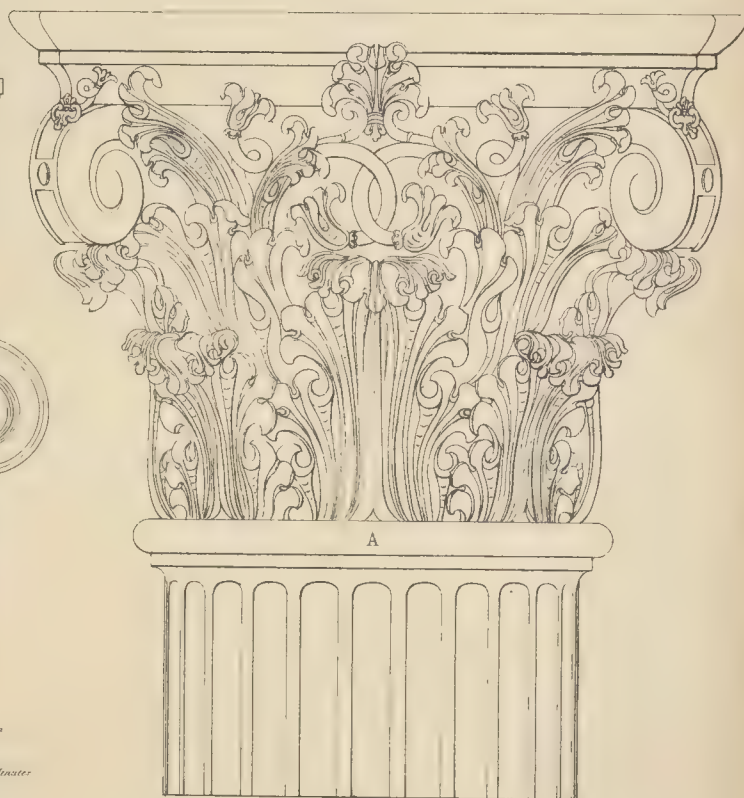
CHAMBER FLOOR AND BACK ELEVATION.

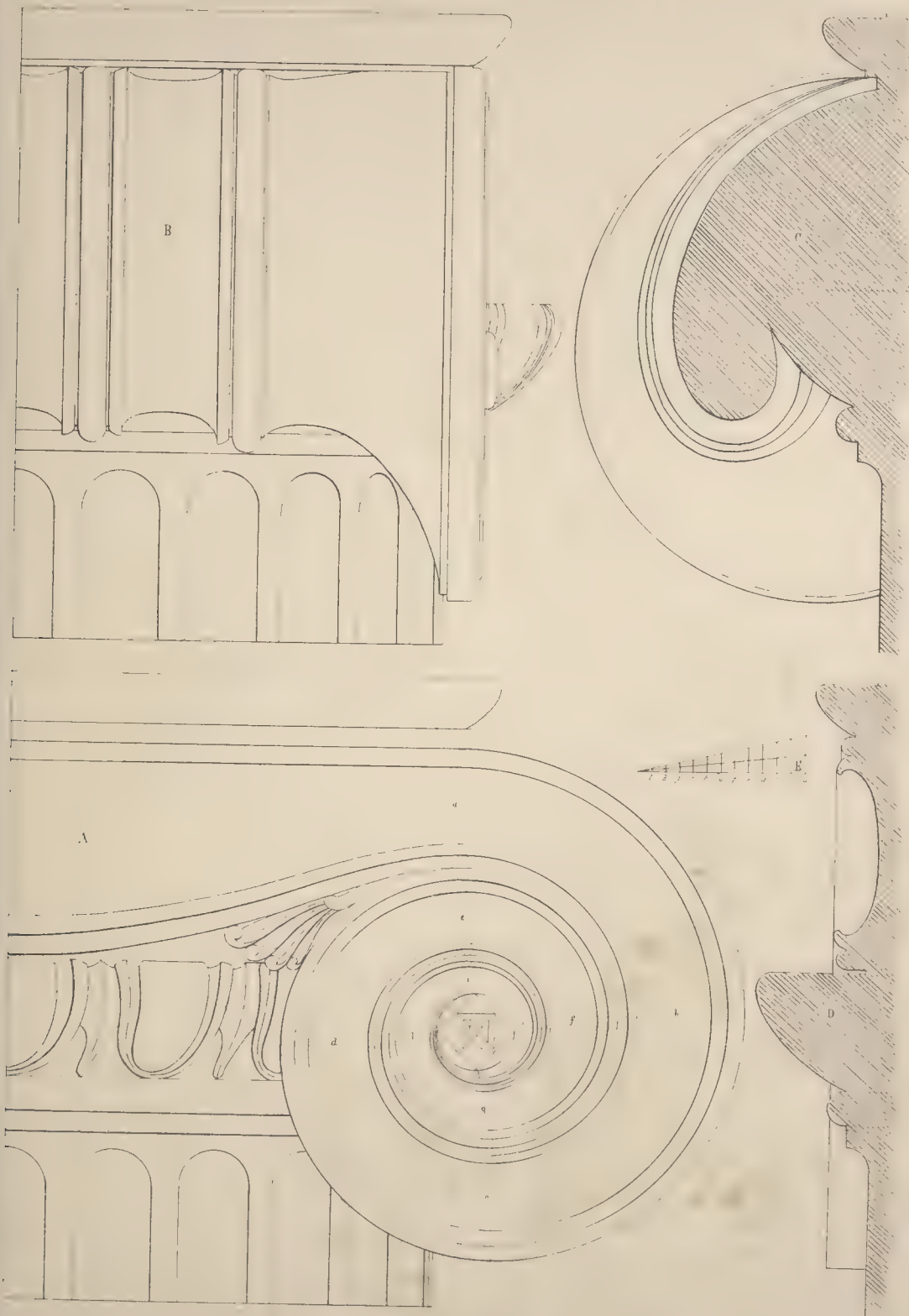


10 5 0 10 20 30 40 50 feet

GRECIAN IONIC ORDER. AND DETAILS.

PLATE XVI.





DESIGNS FOR A COTTAGE.

PLATE XVIII

Fig 6

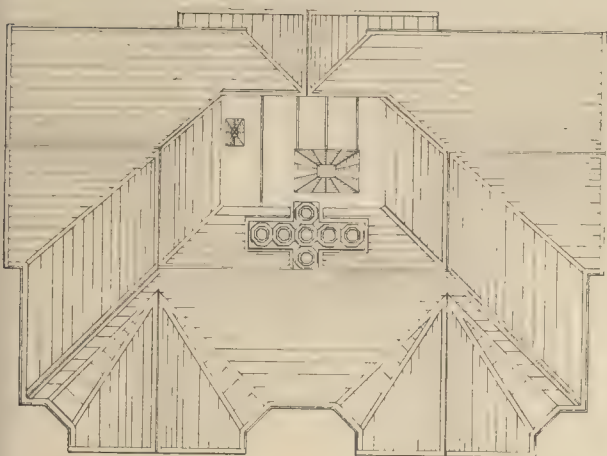


Fig 5



Fig 2



Fig 4



Fig 1

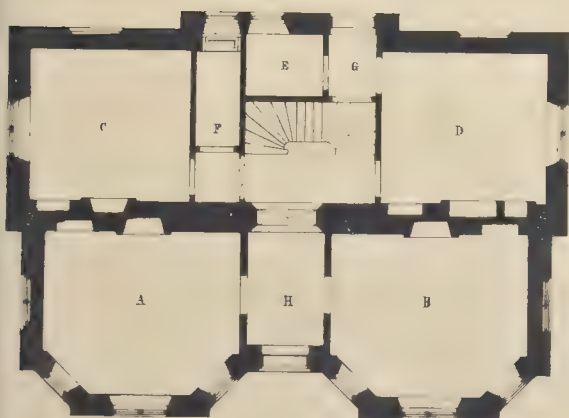


Fig 3



10 5 0 10 20 40 60 feet

GROUND PLAN AND FRONT ELEVATION.

PLATE XIX.



10 5 0 10 20 30 40 50 feet

CHAMBER FLOOR AND BACK ELEVATION.

PLATE XX.

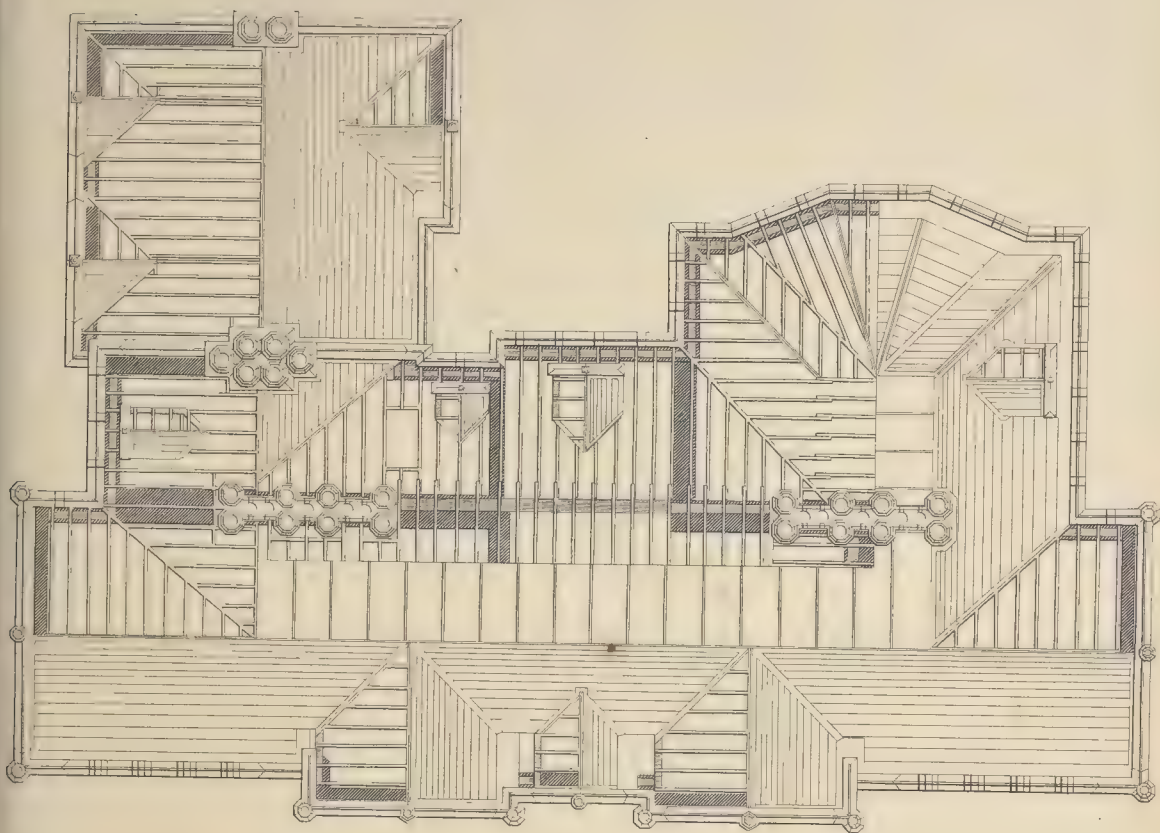


10 6 0 10 20 30 40 50 feet

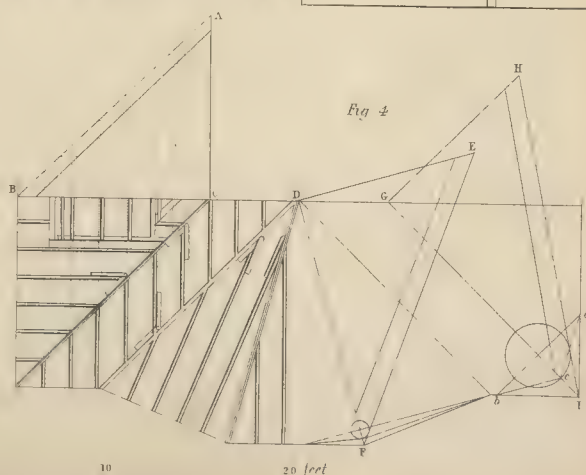
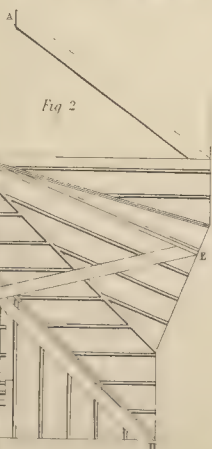
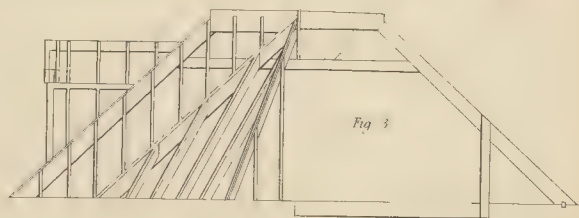
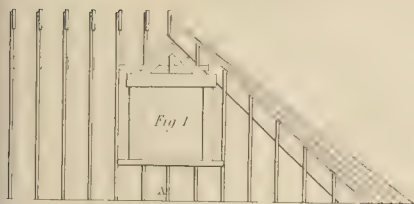


PLAN OF ROOF

PLATE XXII.



10 0 10 20 30 40 50 feet



10 0 10 20 feet

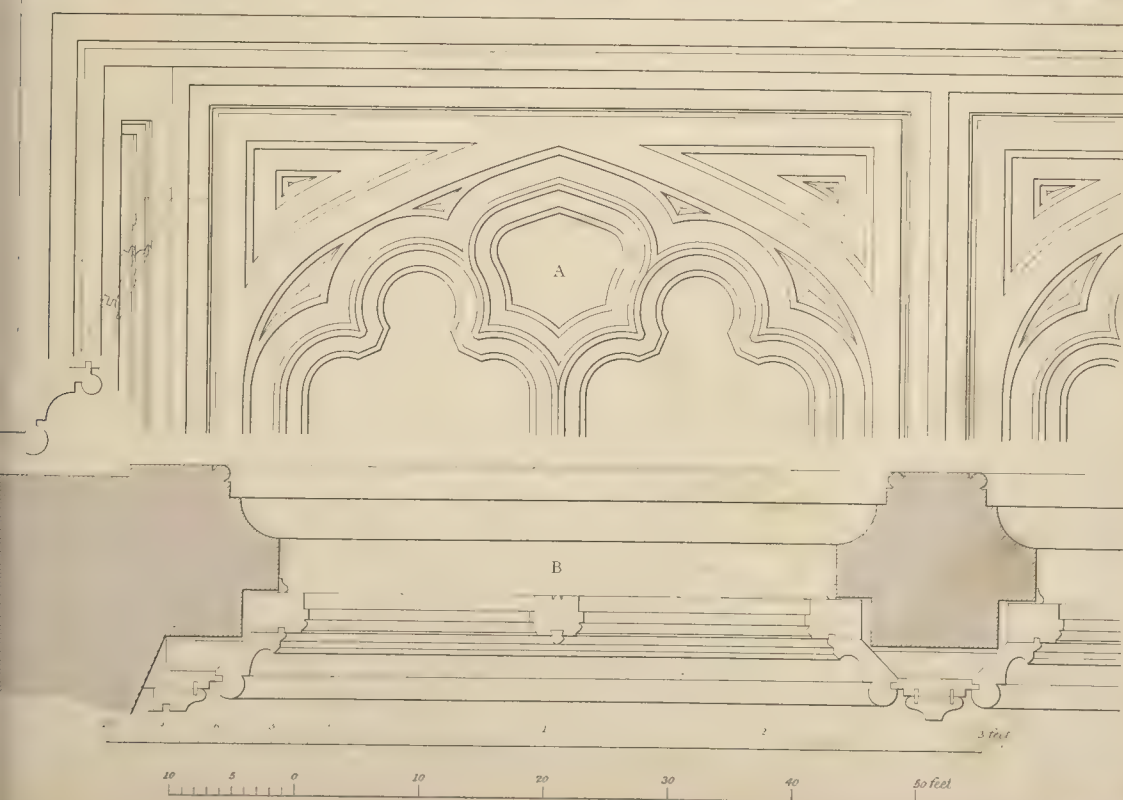
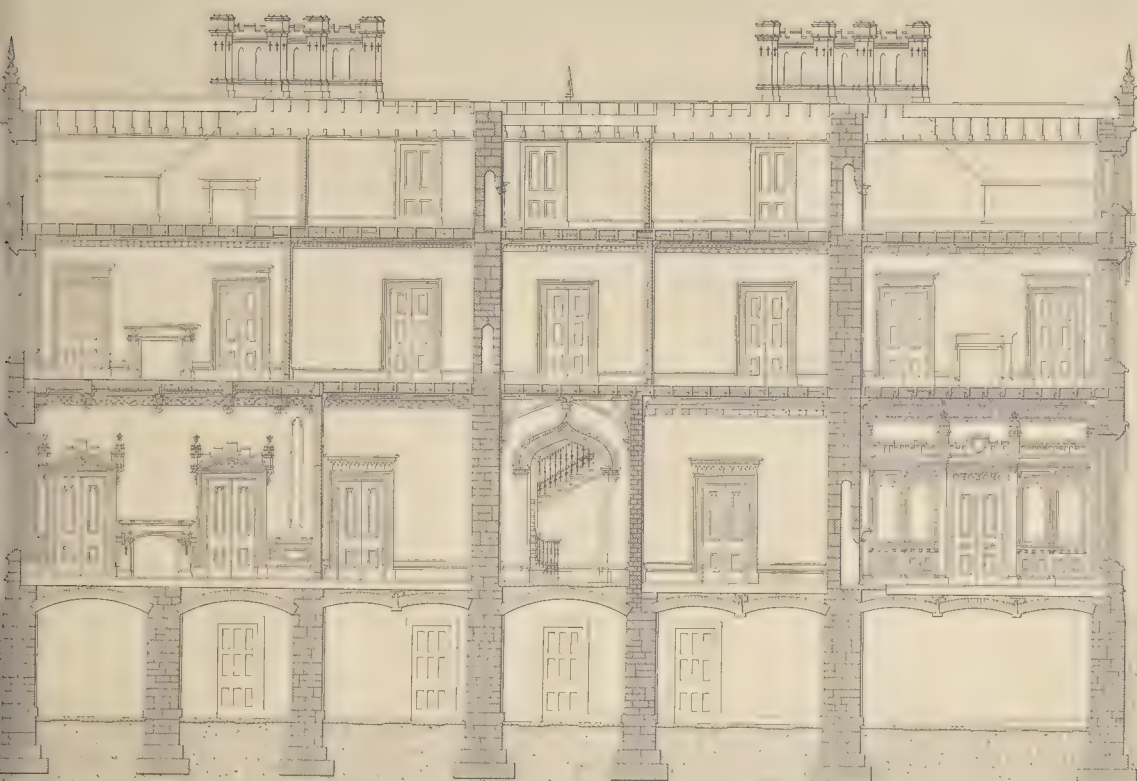




Fig. 3

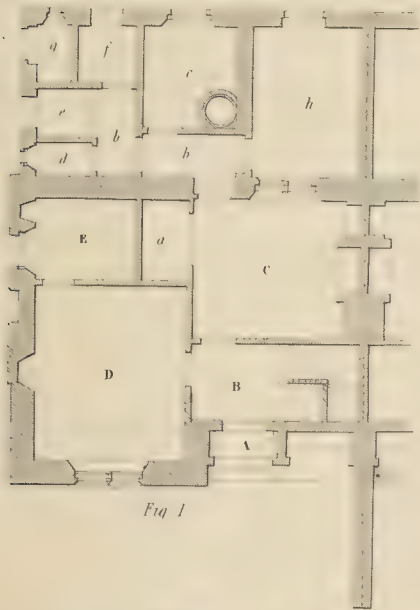


Fig. 1

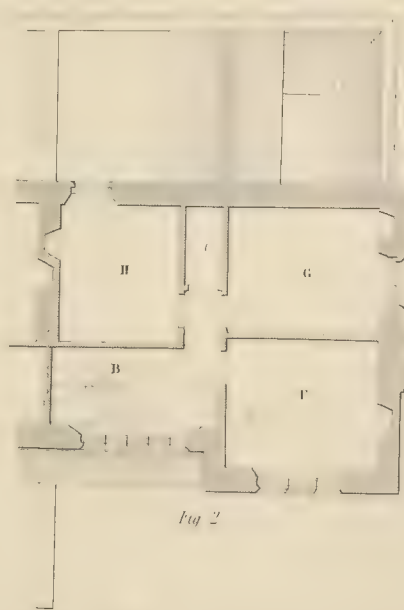


Fig. 2



Fig. 4



Fig. 5

GROUND PLAN AND FRONT ELEVATION

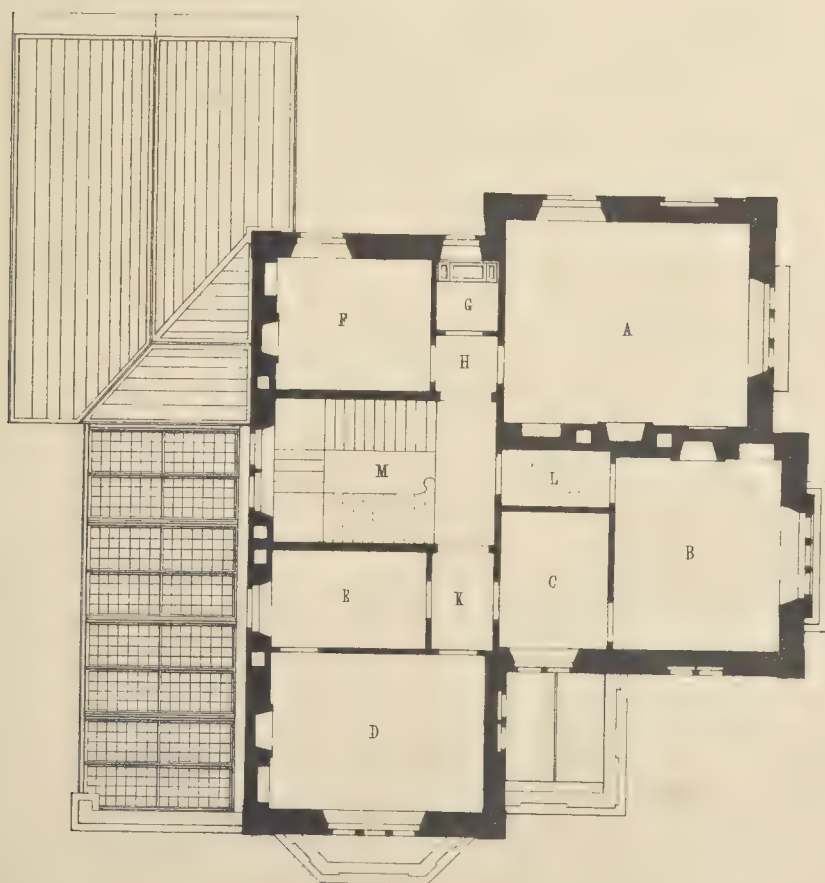
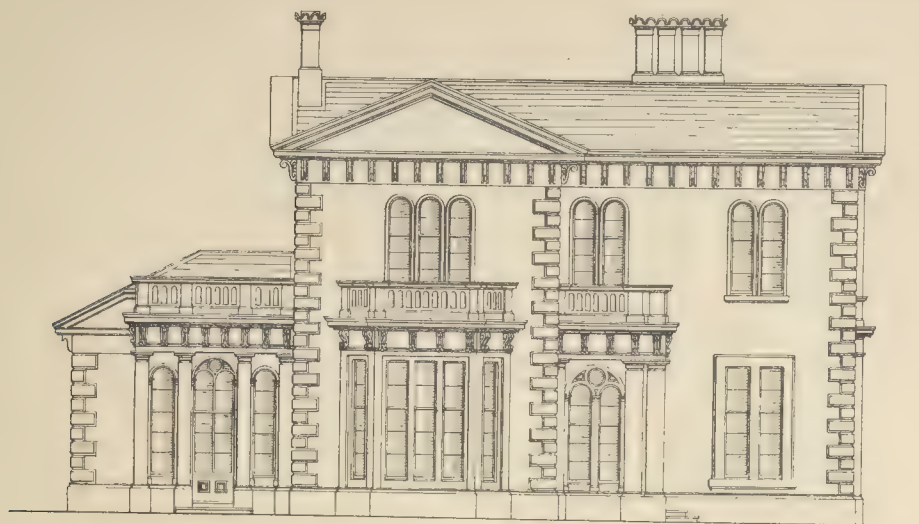
PLATE XXV



10 5 0 10 20 30 40 50 feet

CHAMBER FLOOR AND FLANK ELEVATION.

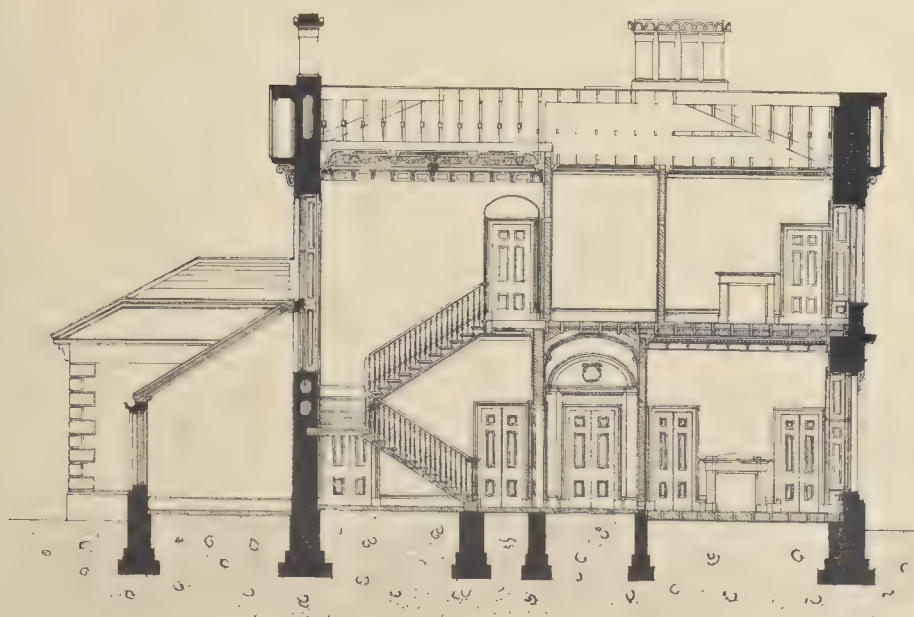
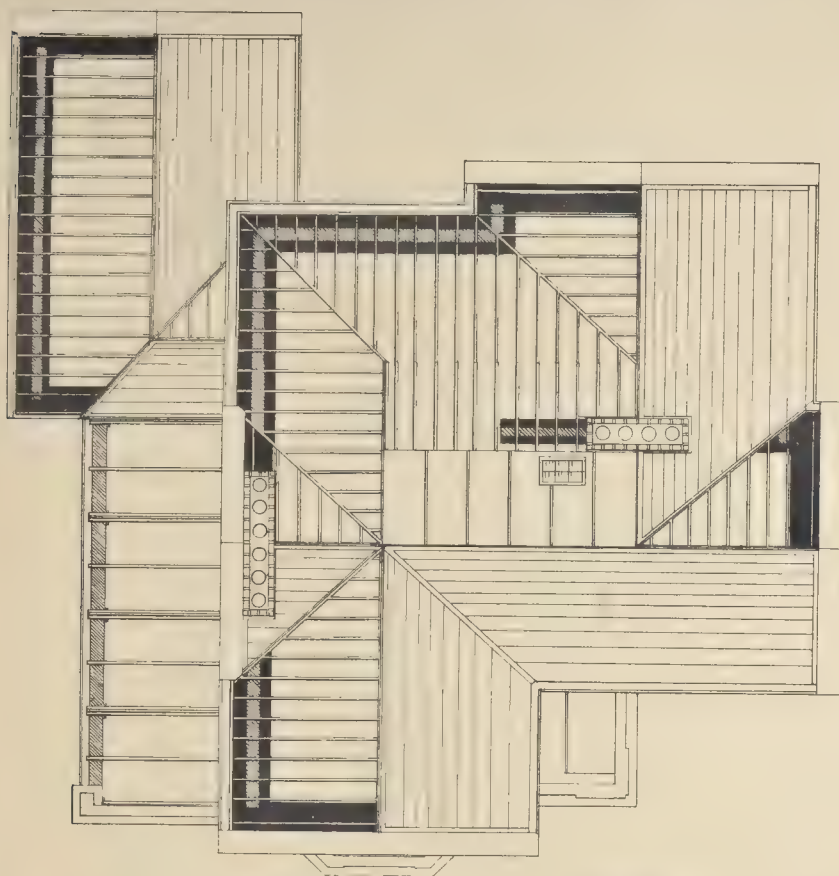
PLATE XXVI.



10 5 0 10 20 30 40 50 feet.

SECTION AND PLAN OF ROOF

PLATE XXVII.



10 20 30 40 50 feet

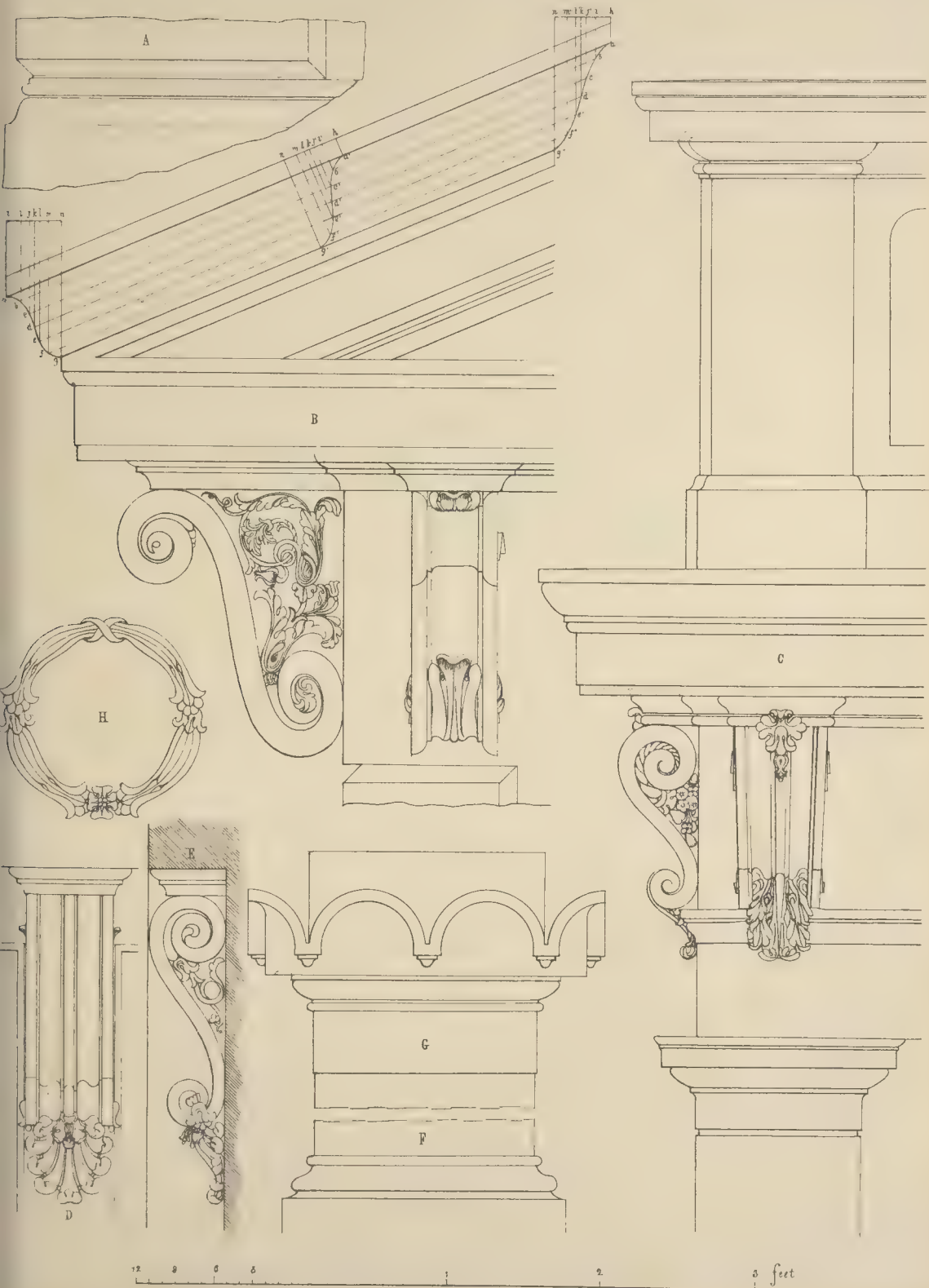


Fig 1.



Fig 2

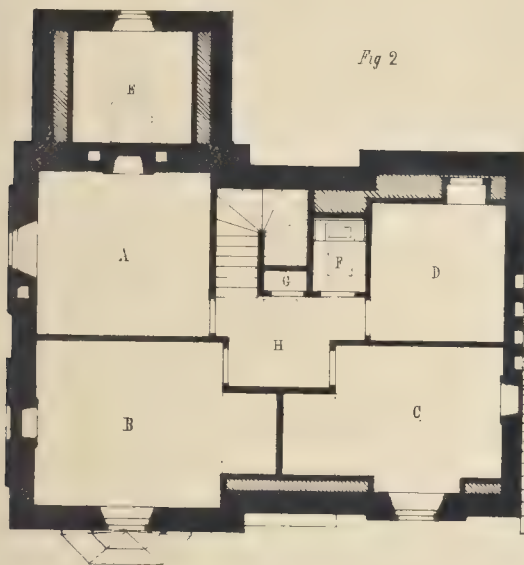


Fig 3

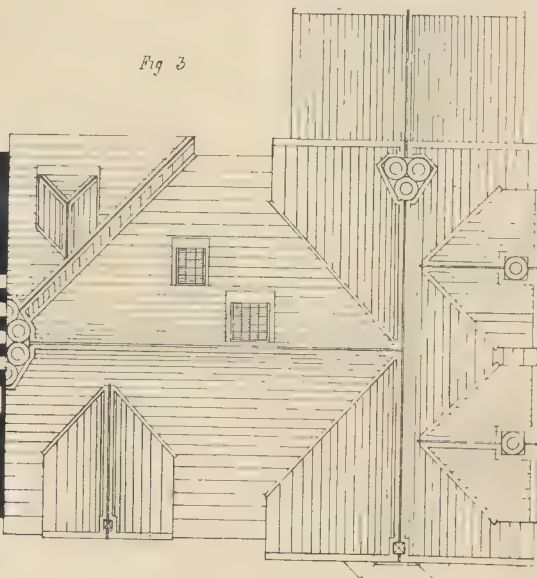
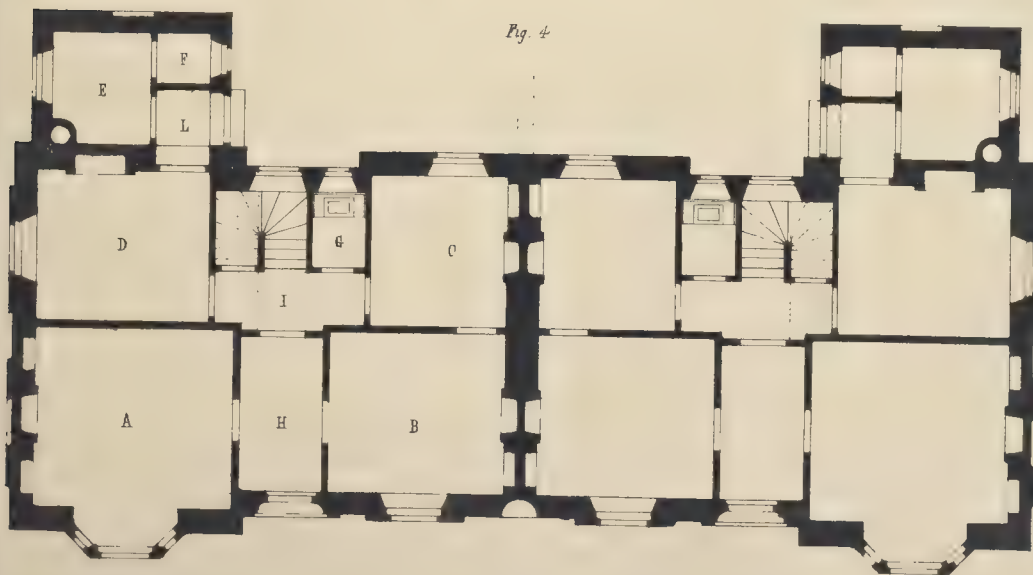


Fig. 4



GROUND PLAN AND FRONT ELEVATION.



10 5 0 10 20 30 40 50 feet.

CHAMBER FLOOR AND END ELEVATION.

PLATE XXXI.

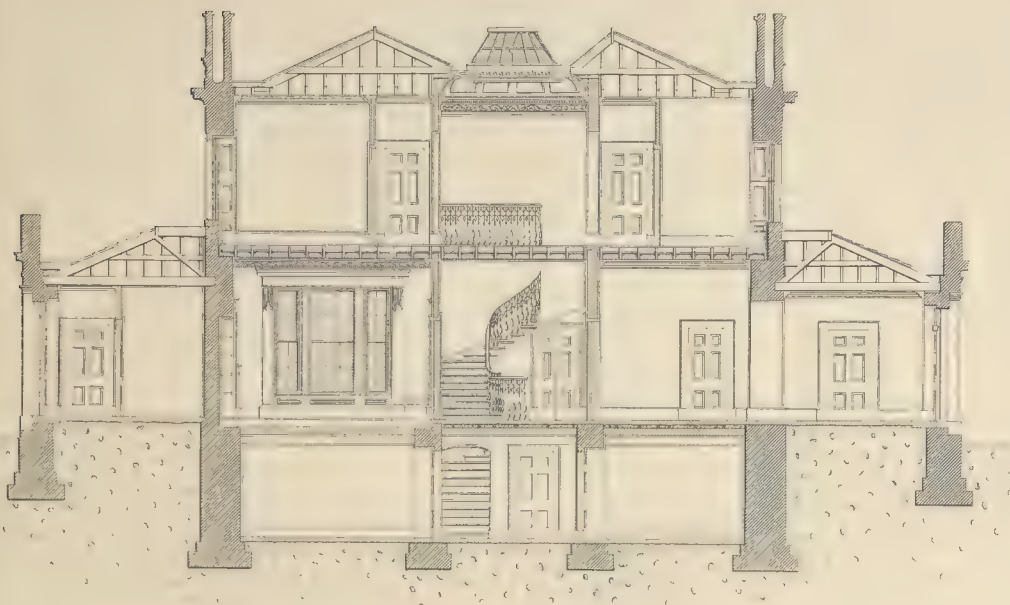


10 20 30 40 50 feet

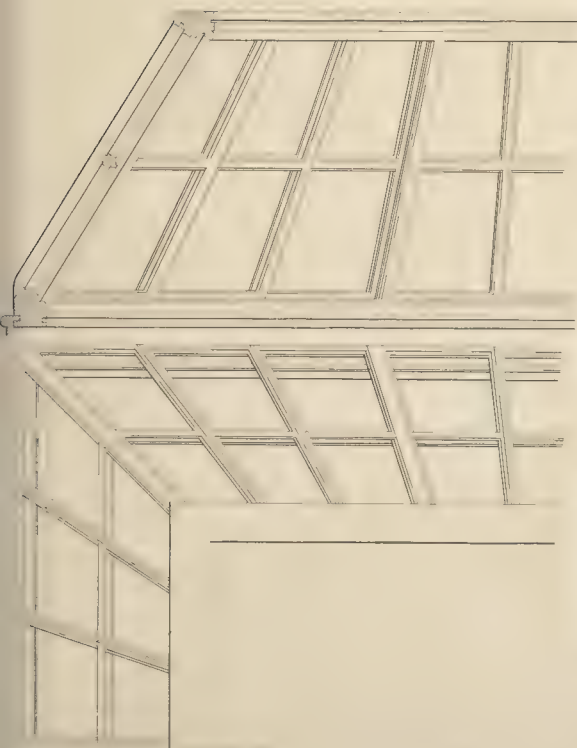
Scale

SECTION AND DETAILS.

PLATE XXXVII.



10 5 0 10 20 30 40 50 feet

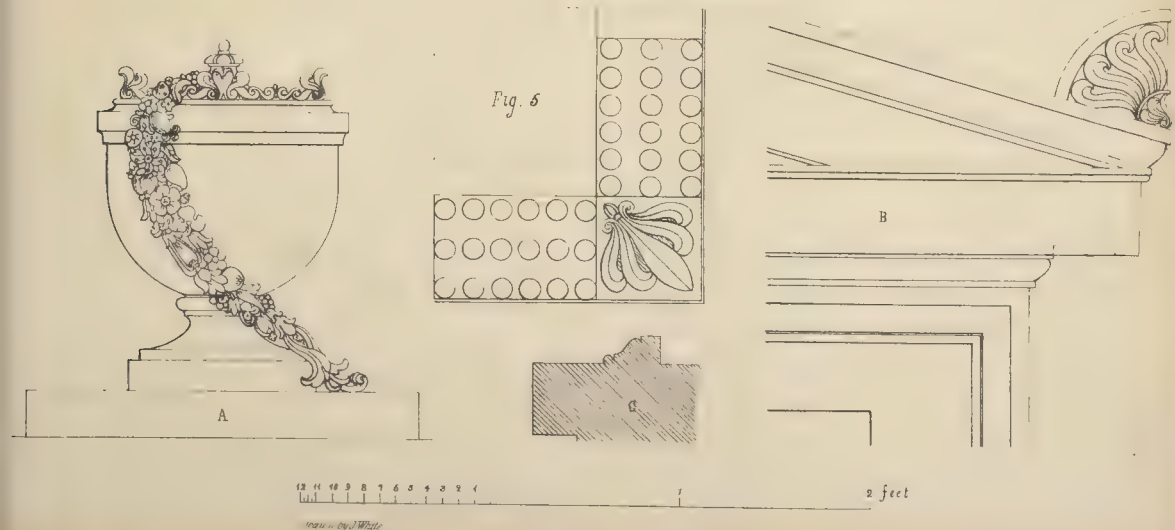
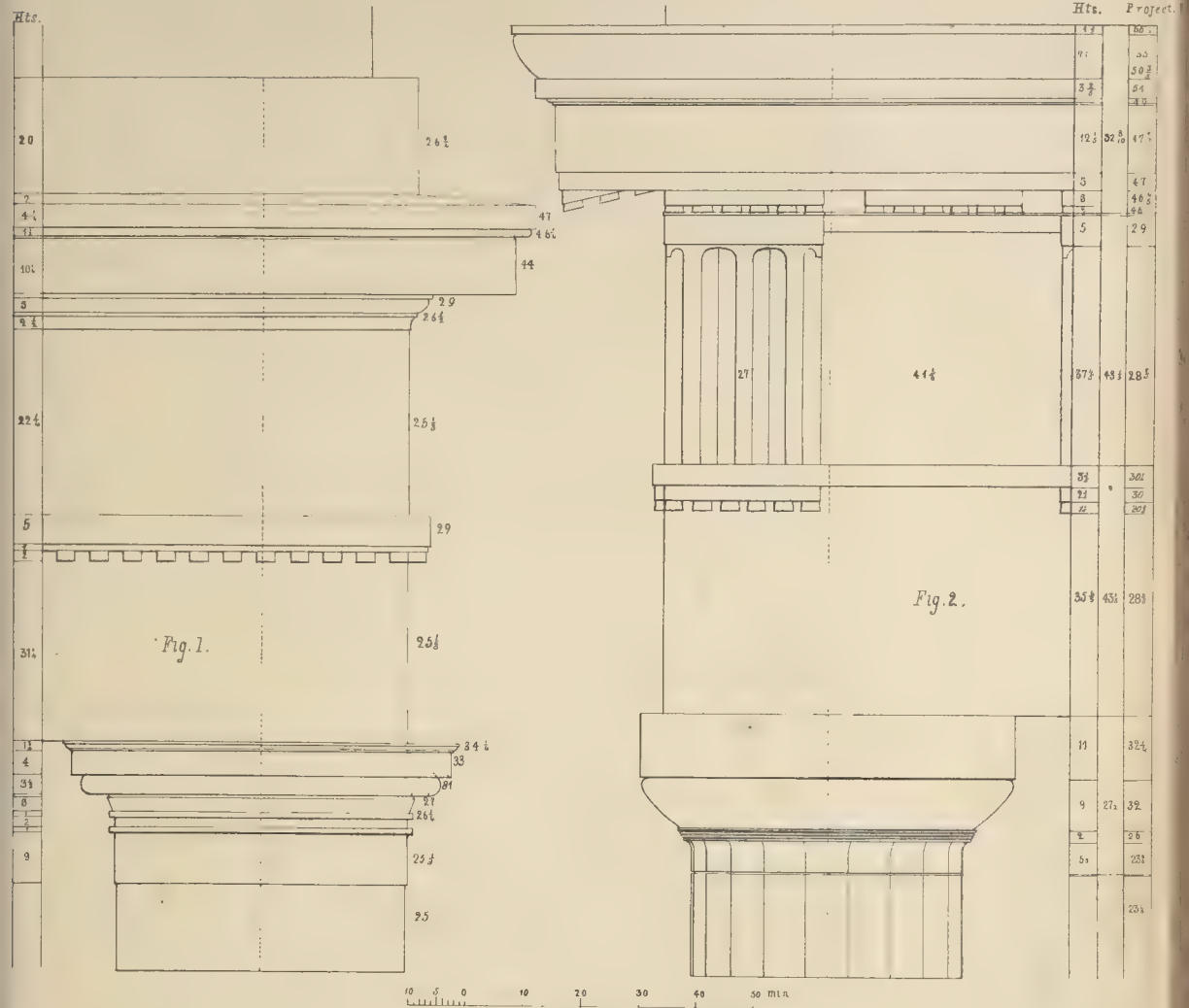


12 0 0 5 10 20 30 40 50 feet

GRECIAN DORIC ORDER

PLATE XXXIII

AND DETAILS.



GROUND PLAN AND FRONT ELEVATION

PLATE XXIV.



10 20 30 40 50 feet.

| | | | | | |
|--------------|---|--------------------|-------------|------------|-----|
| 12' high | A | Drawing Room | 19.9 x 17.0 | 11.4 x 3.9 | Bay |
| | B | Parlour | 15.3 x 14.8 | | |
| 13 feet high | D | Dining Room | 19.6 x 16.0 | | |
| | E | Kitchen | 16.0 x 15.0 | | |
| | F | Pantry | 11.0 x 8.0 | | |
| | G | Terrace Bedroom | 11.0 x 7.9 | | |
| | H | Larder | 10.0 x 5.6 | | |
| | I | Water C. & Bath R. | 10.0 x 6.0 | | |
| | J | Vestibule | 15.10 x 7.9 | | |
| | M | Passage | 10.0 x 4.8 | | |
| | N | Garage | 17.0 x 11.4 | | |
| | O | Entrance Hall | 8.0 x 6.4 | 13' high | |
| | P | Grain House | 20.6 x 11.9 | | |

CHAMBER FLOOR AND FLANK ELEVATION

PLATE XXXV.

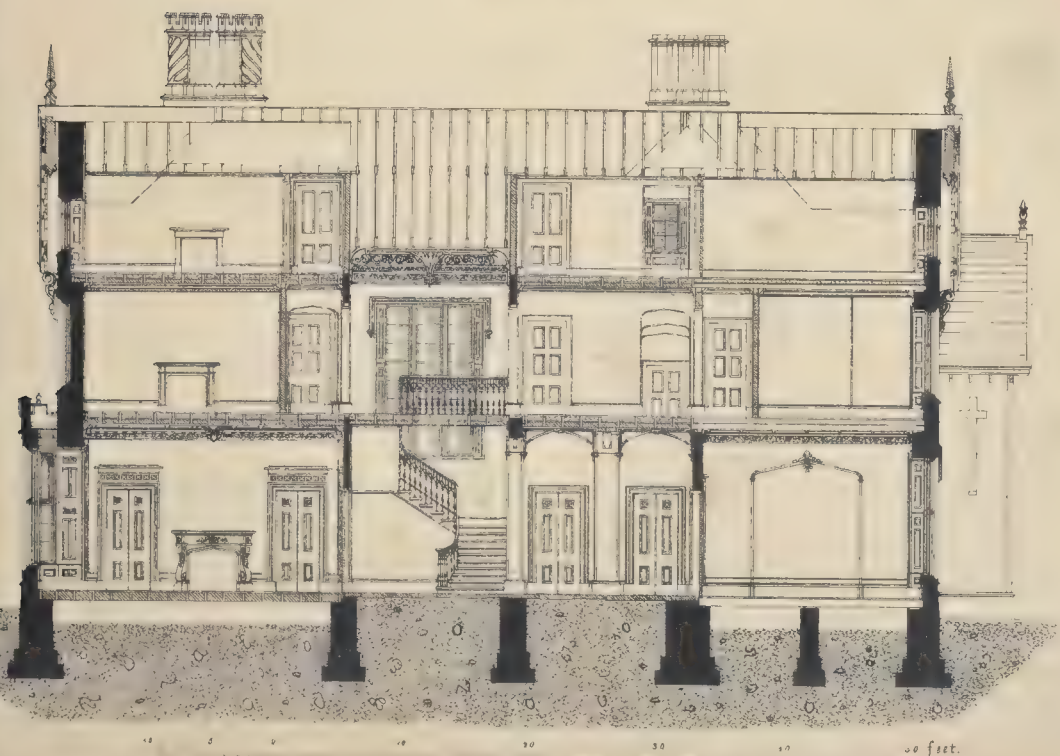
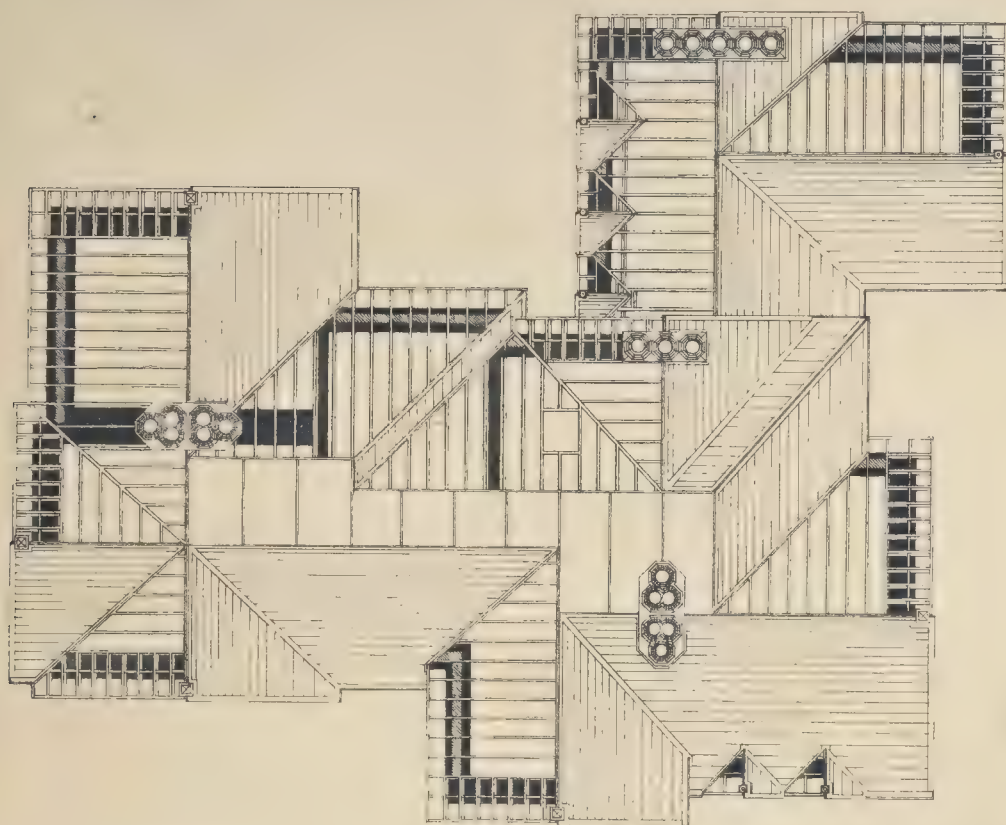


0 5 10 20 30 40 50 feet

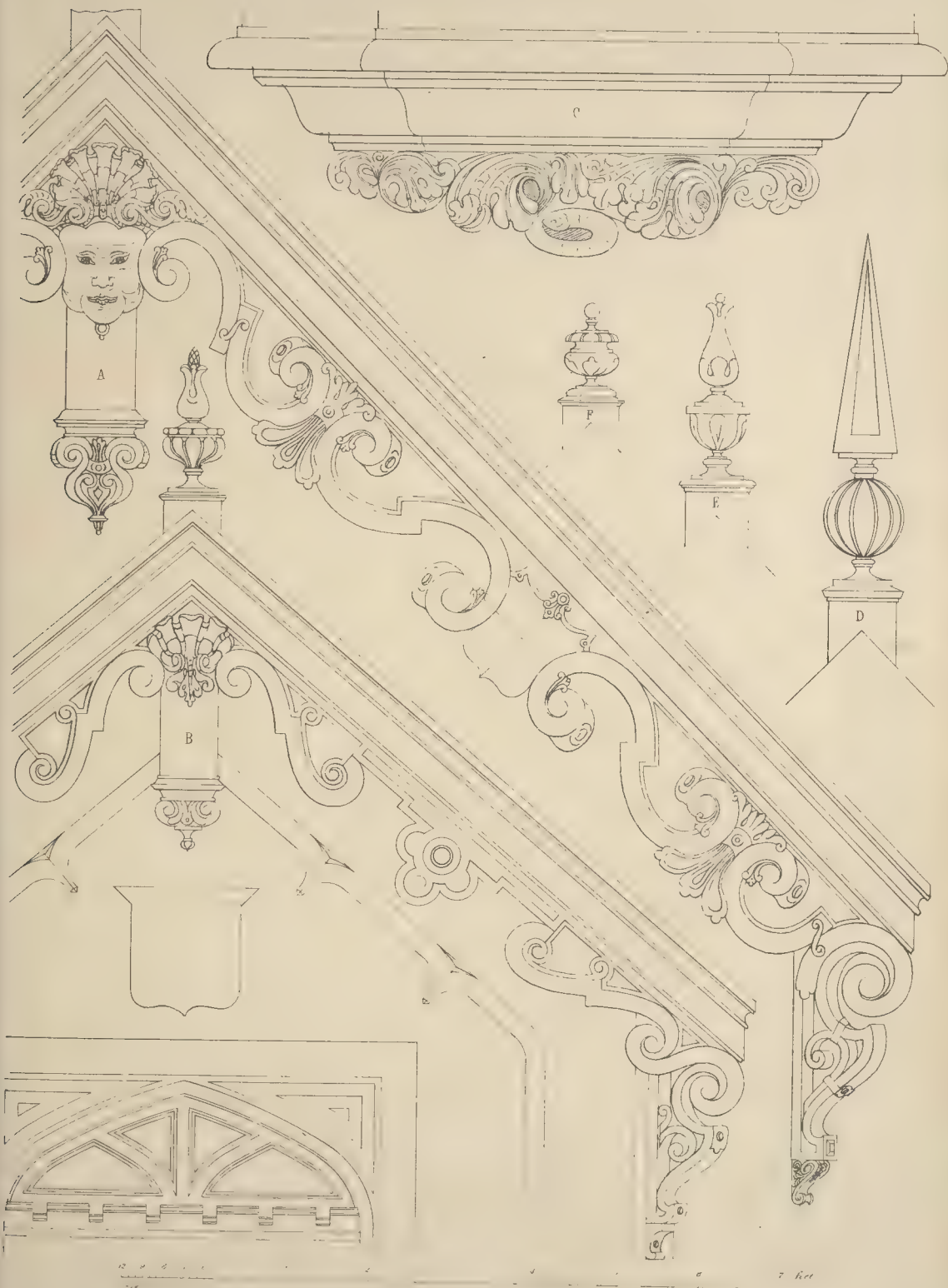
Drawn by J. Wallis

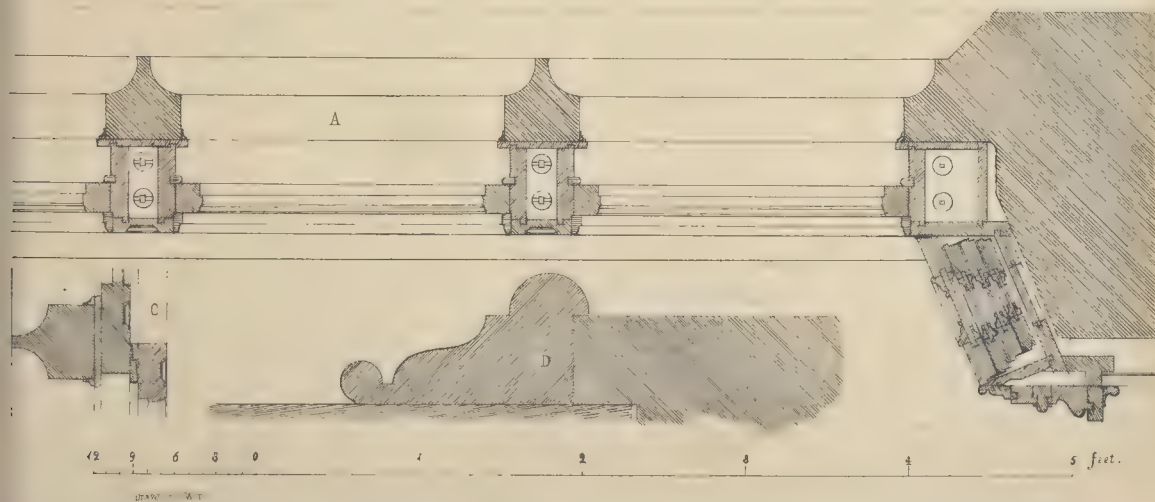
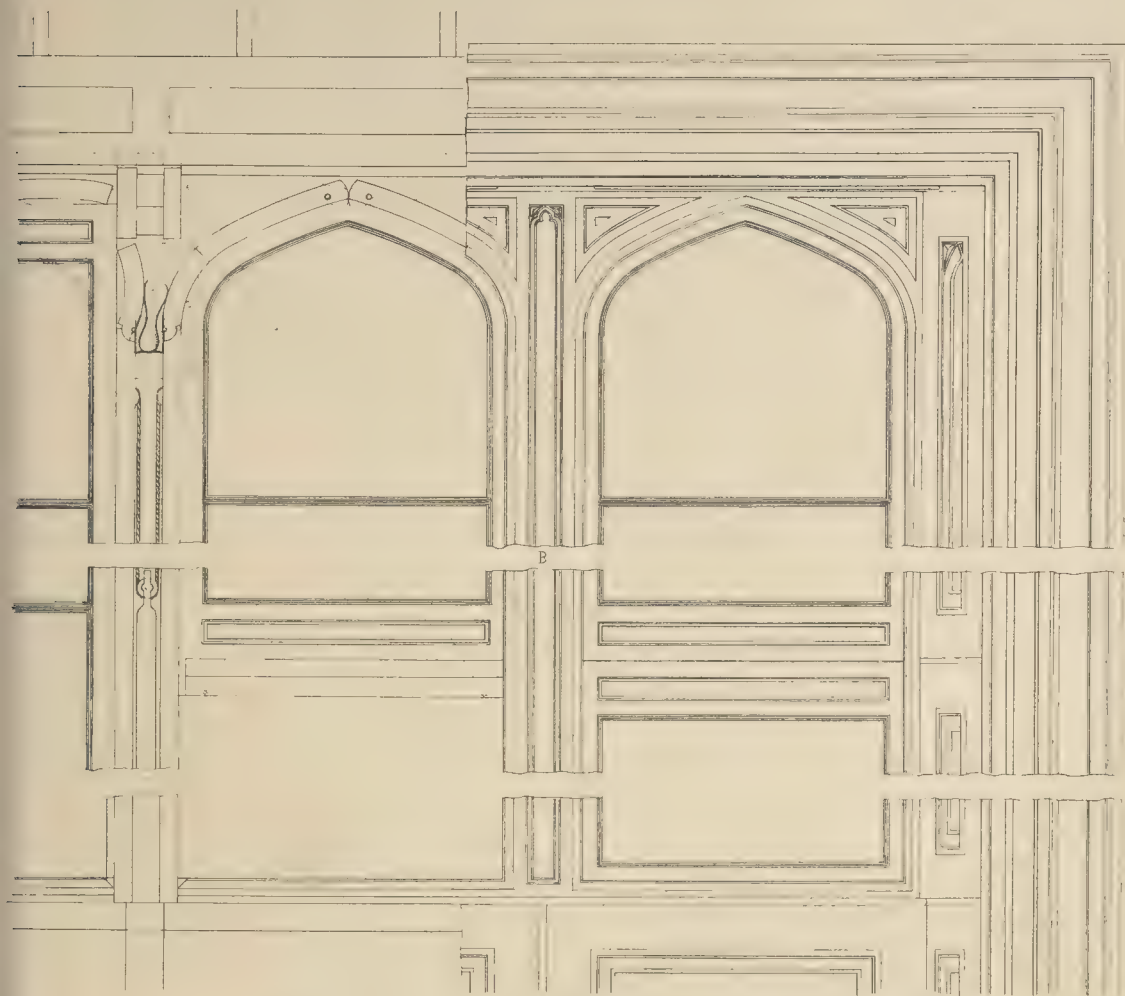
SECTION AND PLAN OF ROOF

PLATE XXXVI

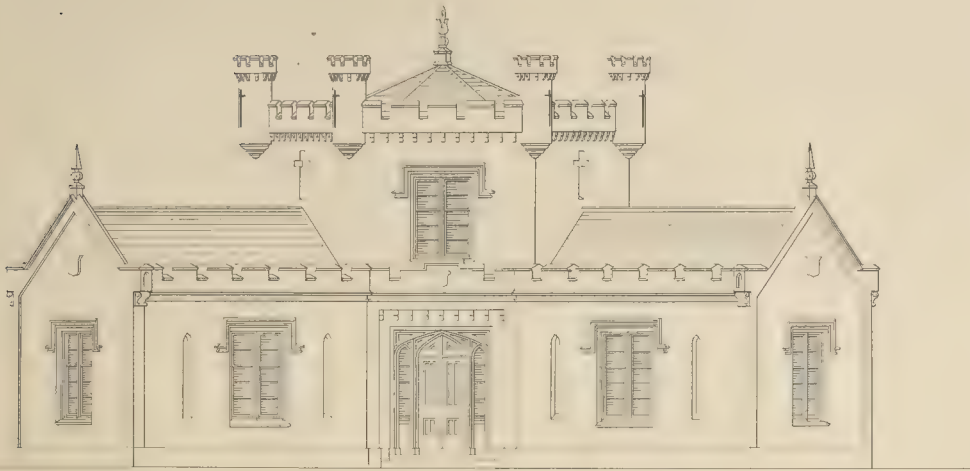


50 feet.





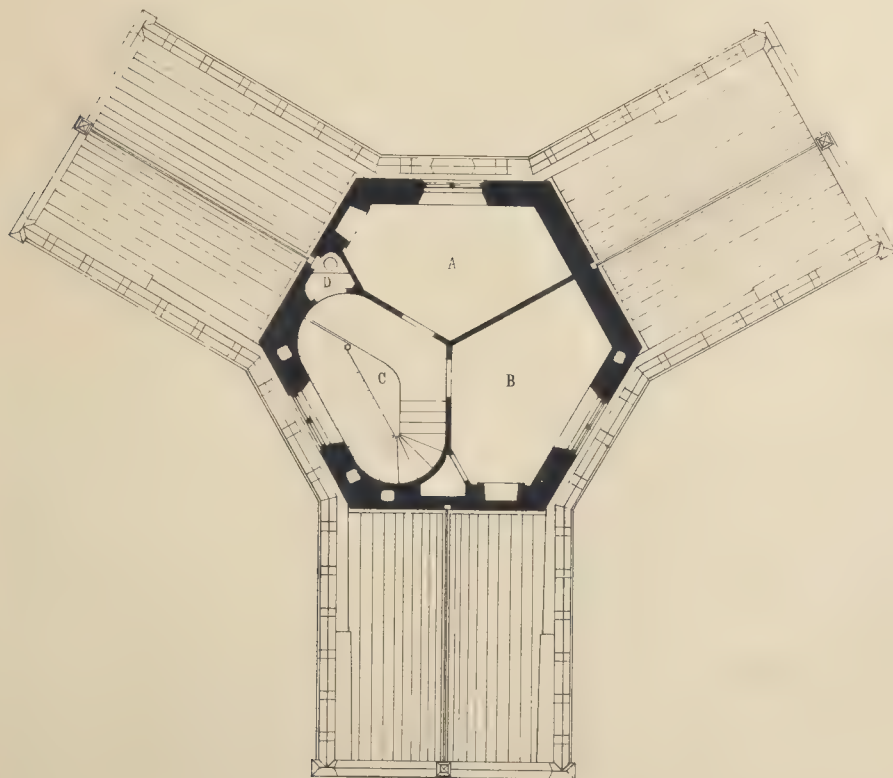
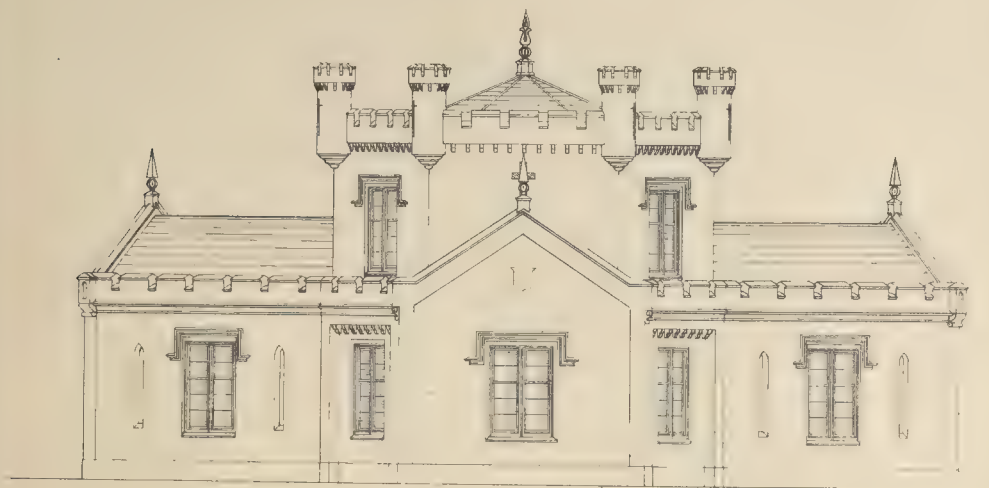
GROUND PLAN AND FRONT ELEVATION.



10 5 0 10 20 30 40 50 feet

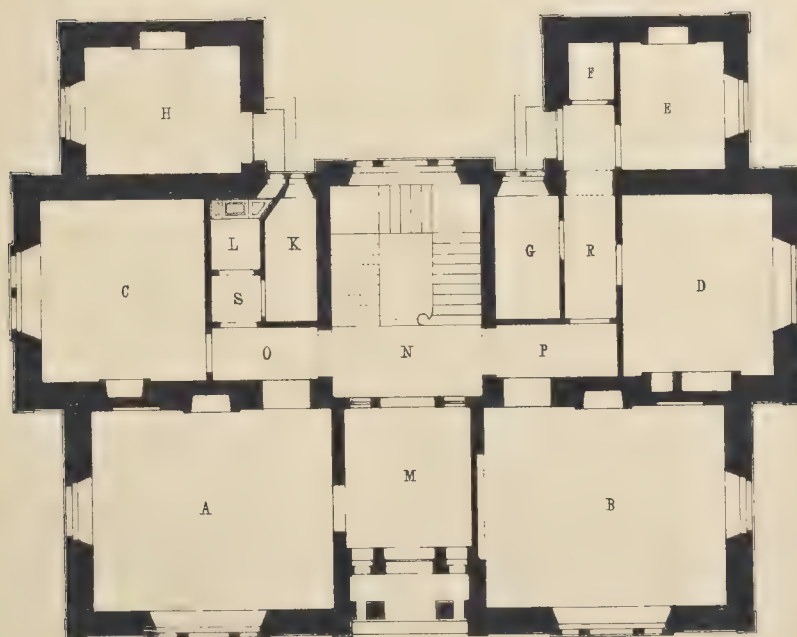
CHAMBER FLOOR AND BACK ELEVATION.

PLATE XL



10 5 0 10 20 30 40 50 feet.

GROUND PLAN AND FRONT ELEVATION.



10 5 0 10 20 30 40 50 feet.

CHAMBER FLOOR AND END ELEVATION.

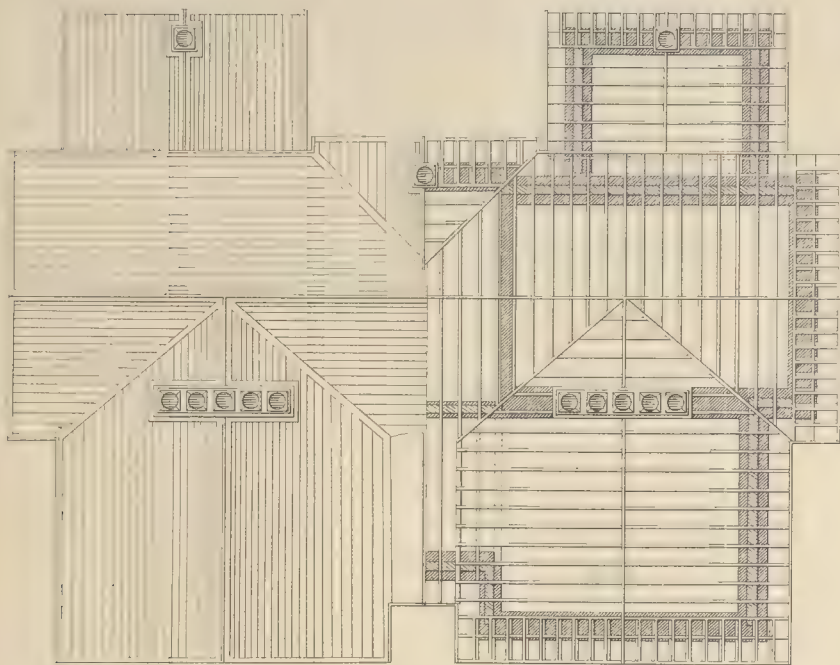
PLATE XLH.



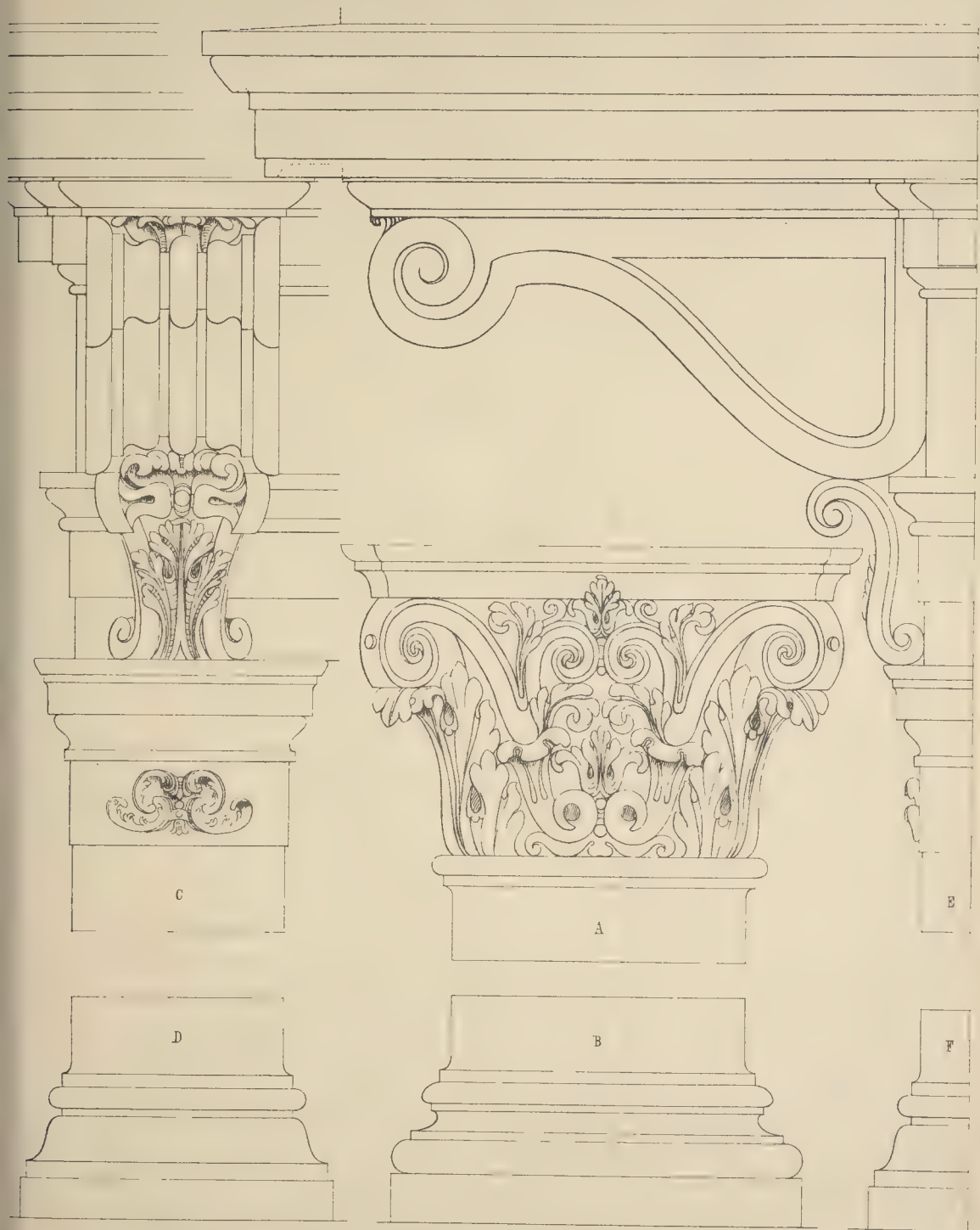
10 20 30 40 50 60 70 80 90 100 feet

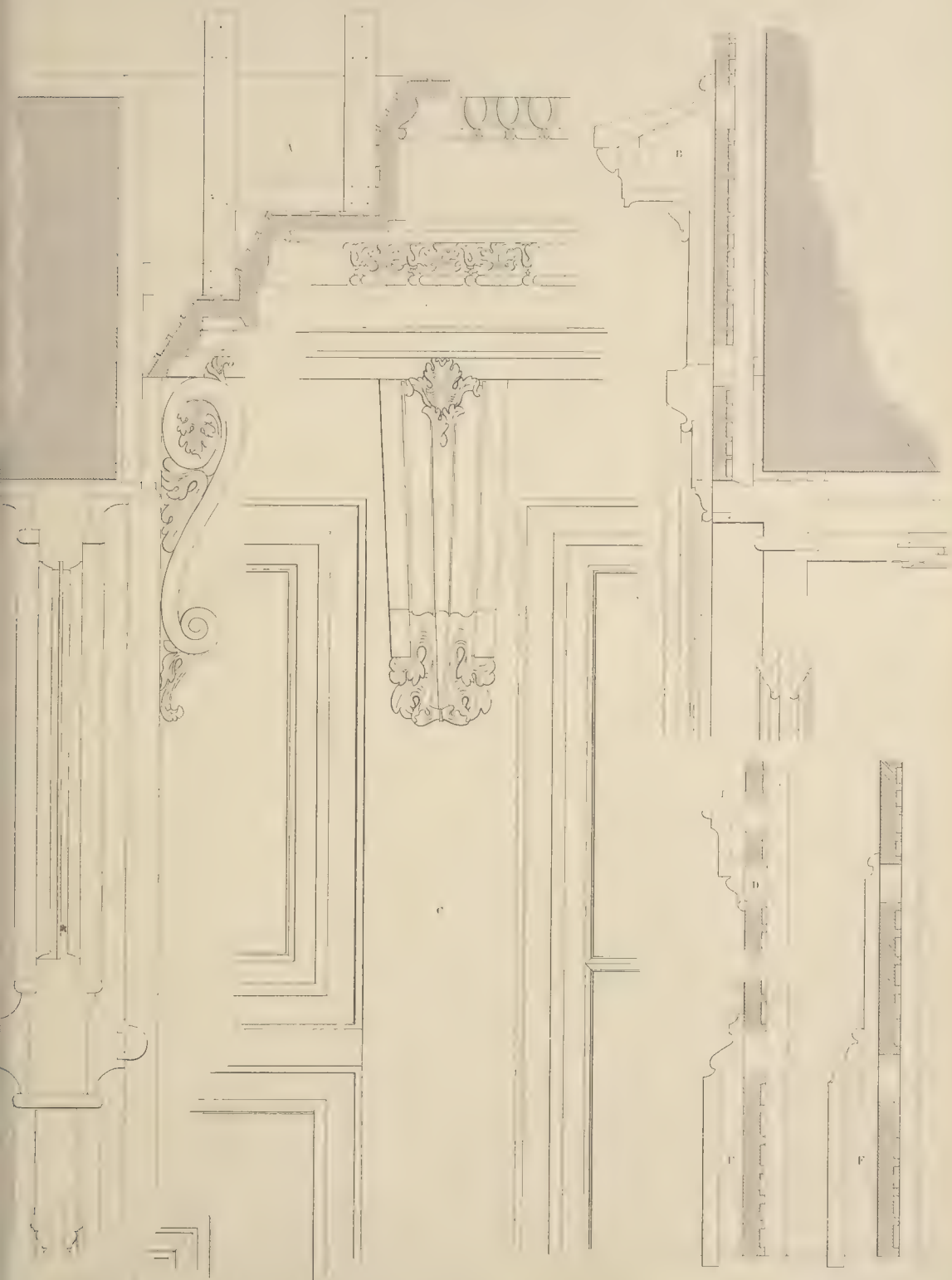
SECTION AND PLAN OF ROOF

PLATE XLIII.



10 5 0 10 20 30 40 feet





English Joint Stock Bank, (Limited)

29, Clements Lane, Lombard Street,

London, E.C. 24 May 1866.

Gentlemen,

It appearing by the Books
you are indebted to this Bank, in
the sum of £436-10-5 I have to
request you will pay the same, with
Interest to me here, without delay.

I am, Gentlemen,

Your obed^t Servant,

Charles F. Kemp.

Provisional Official Liquidator

Messrs Simpson & L.

DESIGNS FOR TWO COTTAGES.

PLATE XLVI.

Fig 3



Fig 6

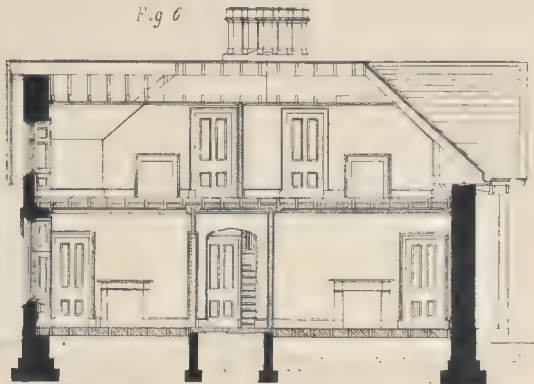


Fig 2



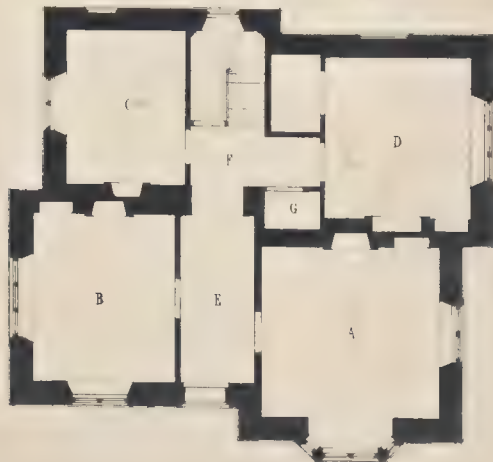
Fig 5



Fig 1



Fig 4



0 5 10 20 30 feet

GROUND PLAN AND FRONT ELEVATION.



10 5 0 40 20 20 40 50 feet

Drawn by J. White

CHAMBER FLOOR AND FLANK ELEVATION

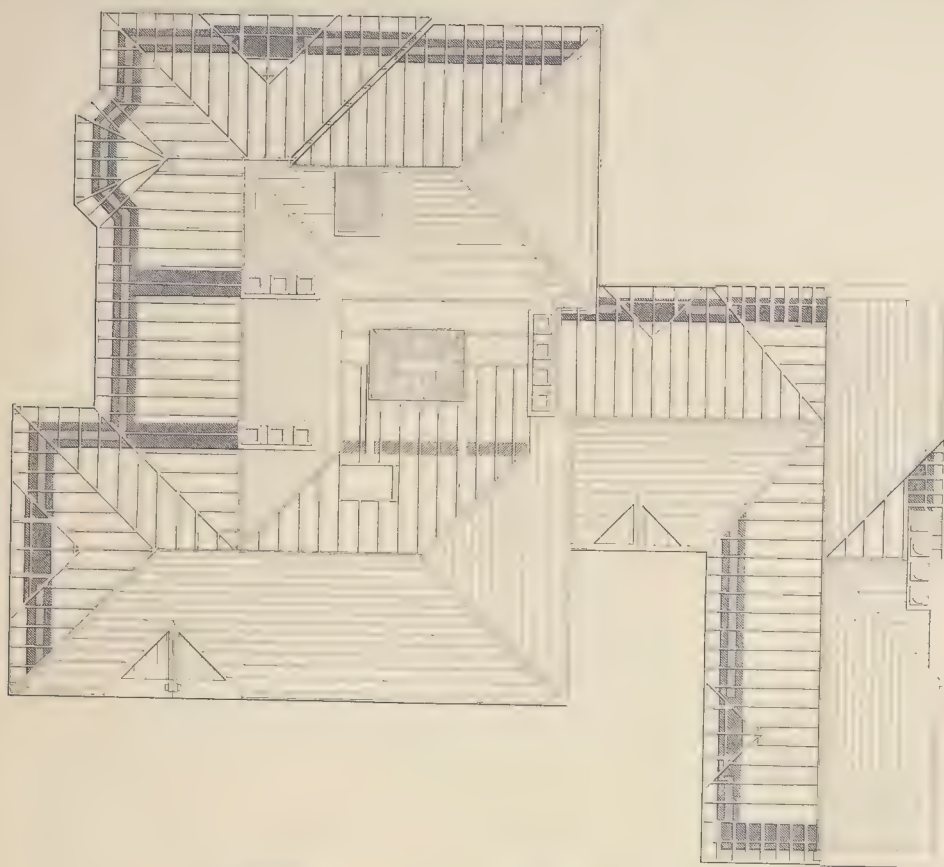
PLATE XLVIII



10 5 0 10 20 30 40 50 feet

SECTION AND PLAN OF ROOF.

PLATE XLIV



10 5 0 10 20 30 40 50 feet

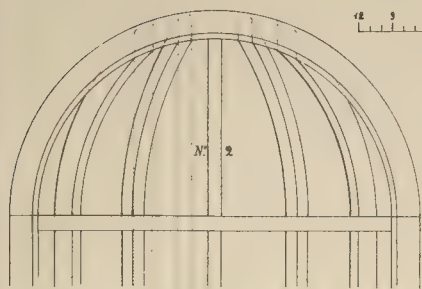


Fig 1

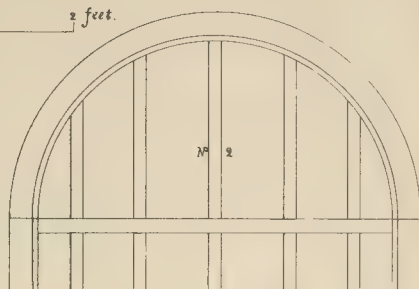
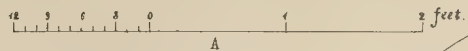
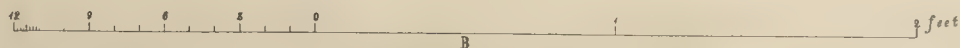
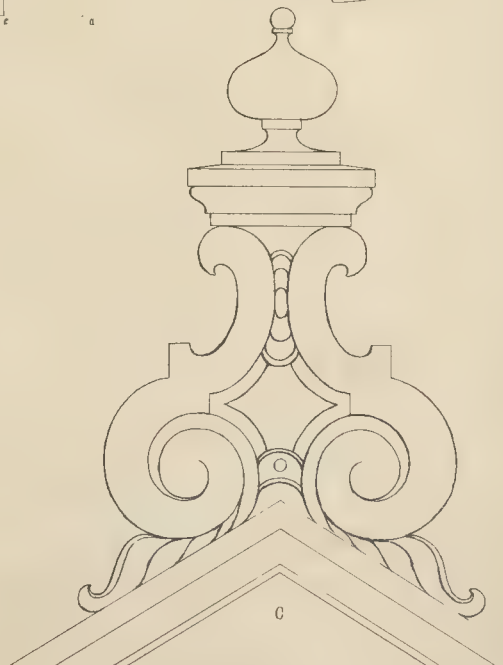
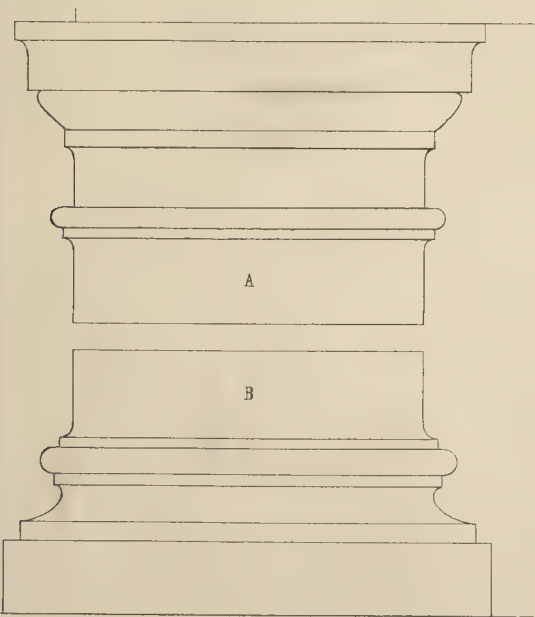
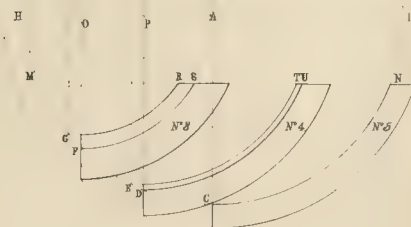
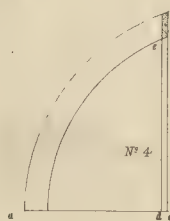
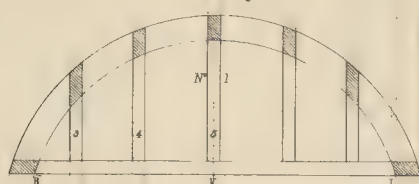
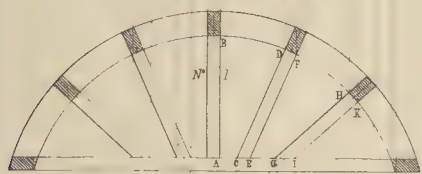
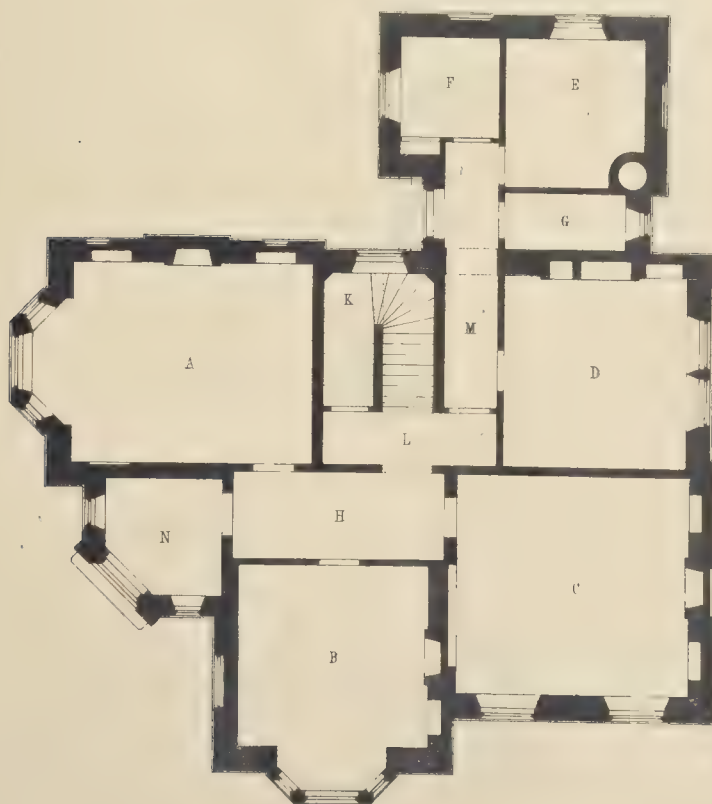


Fig 2



GROUND PLAN AND FRONT ELEVATION

PLATE LI

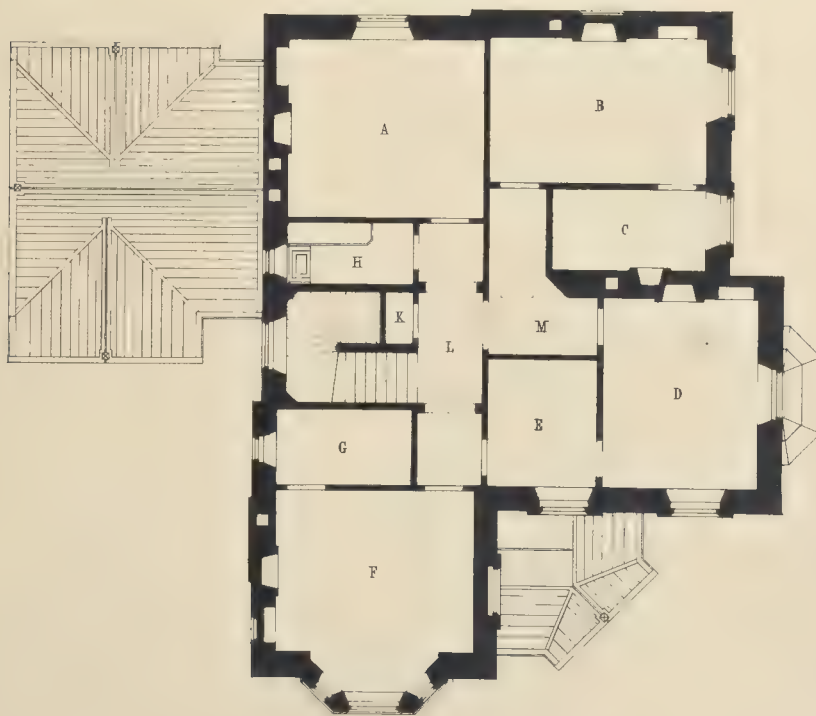


10 6 0 10 20 30 40 50 feet

2000 - 1890

CHAMBER FLOOR AND FLANK ELEVATION.

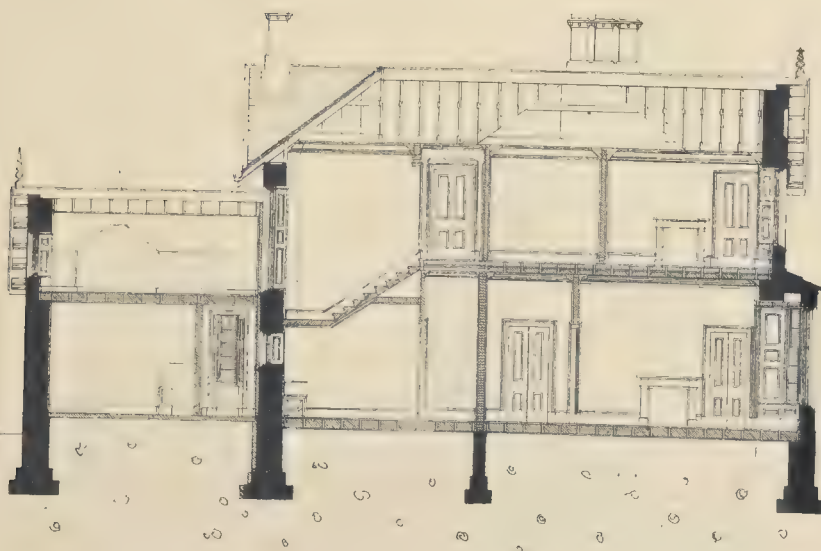
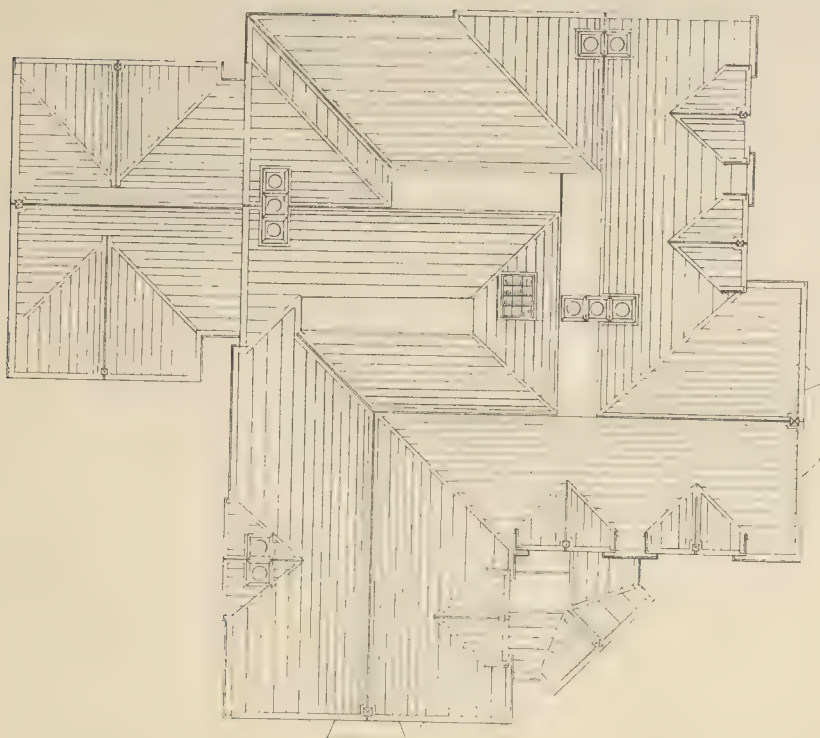
PLATE LII



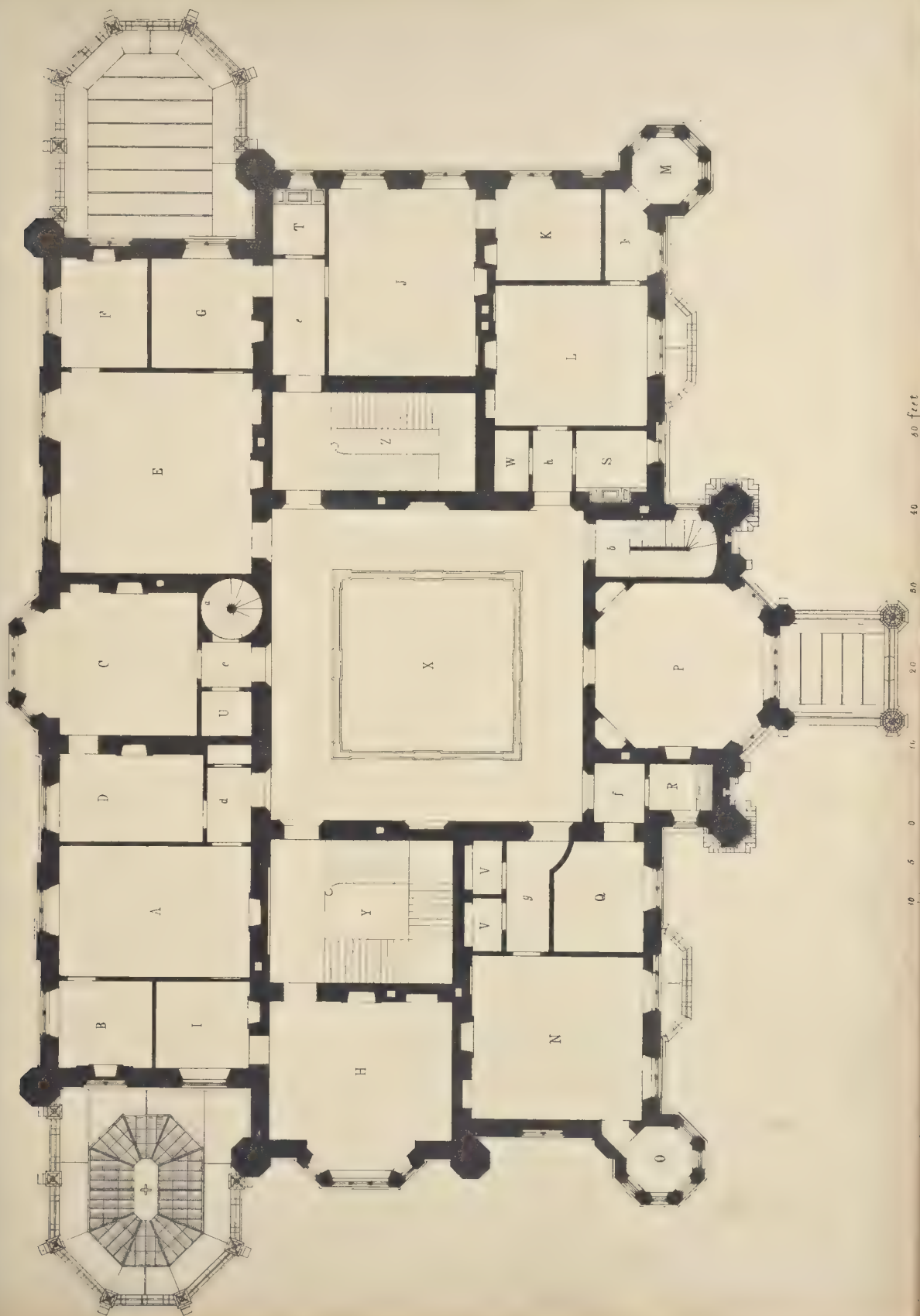
10 5 0 10 20 30 40 50 feet.

SECTION AND PLAN OF ROOF

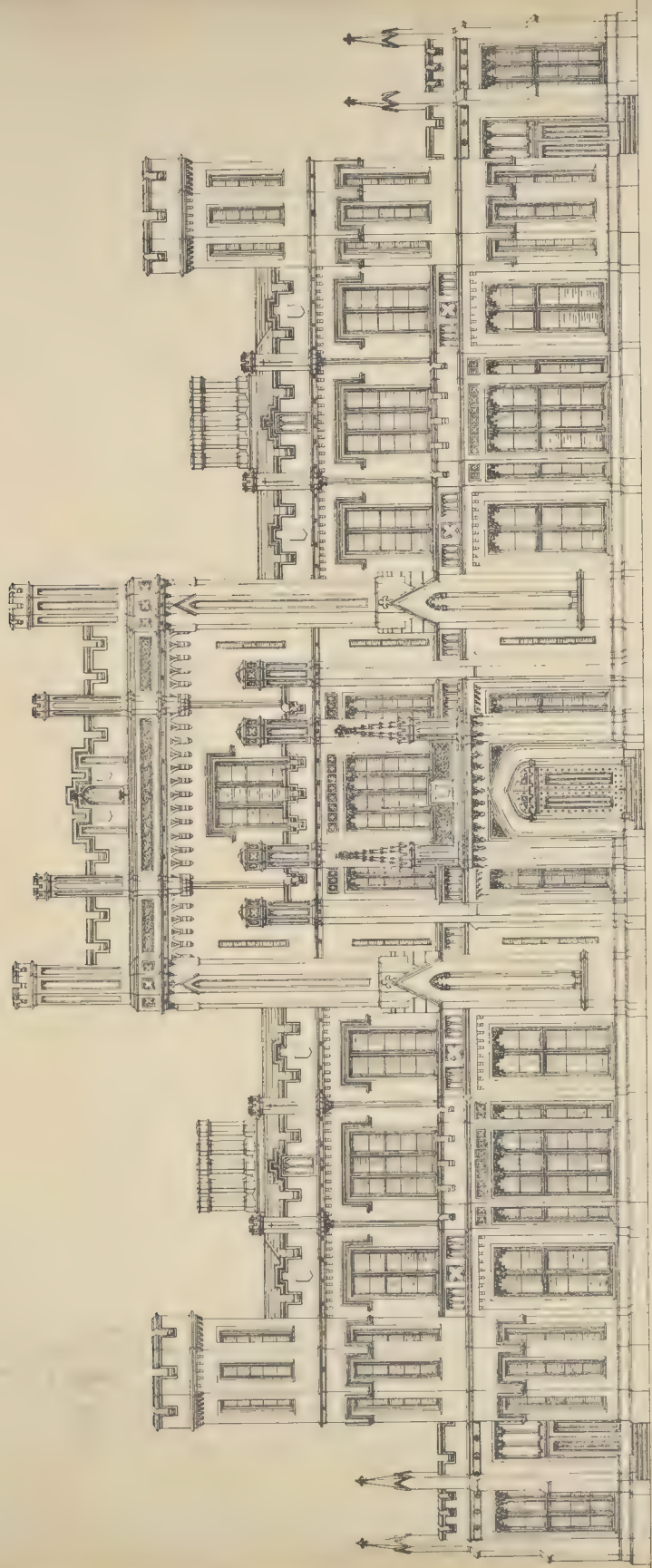
PLATE LIII



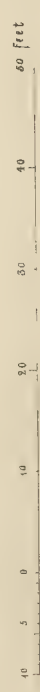




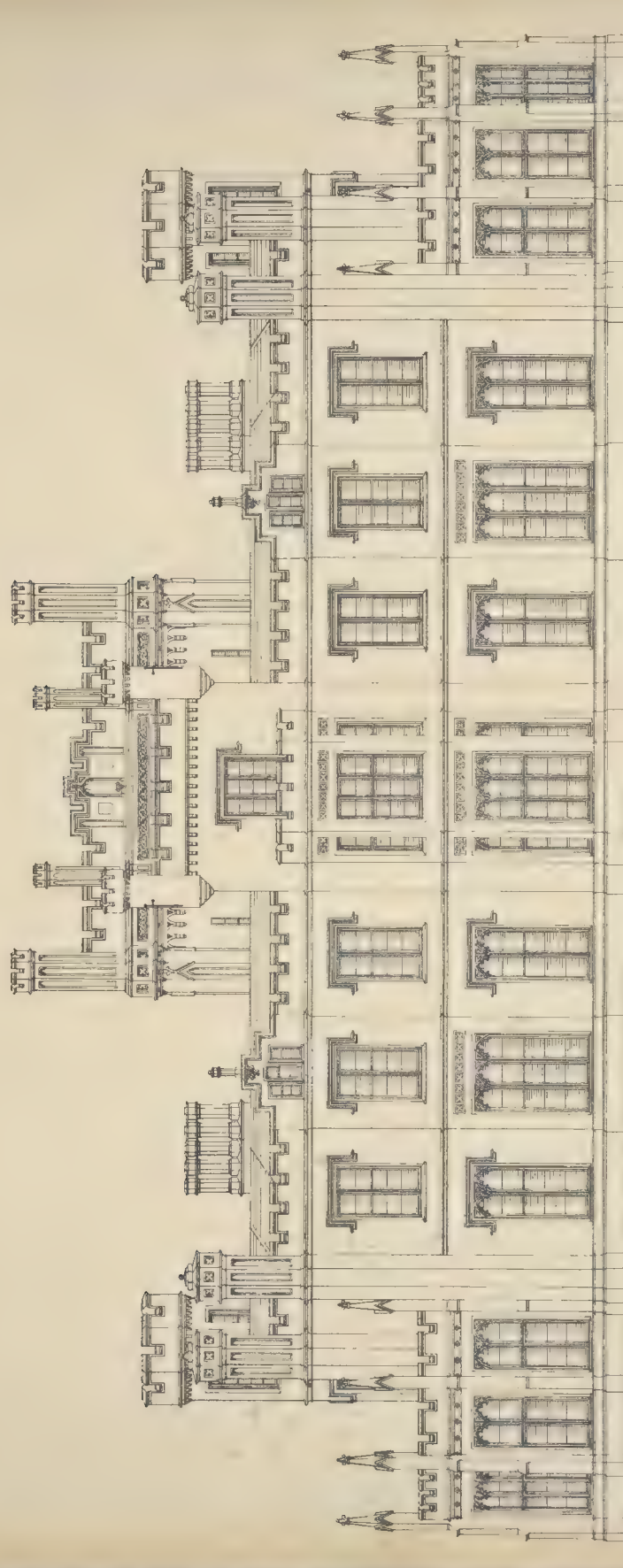
FRONT ELEVATION



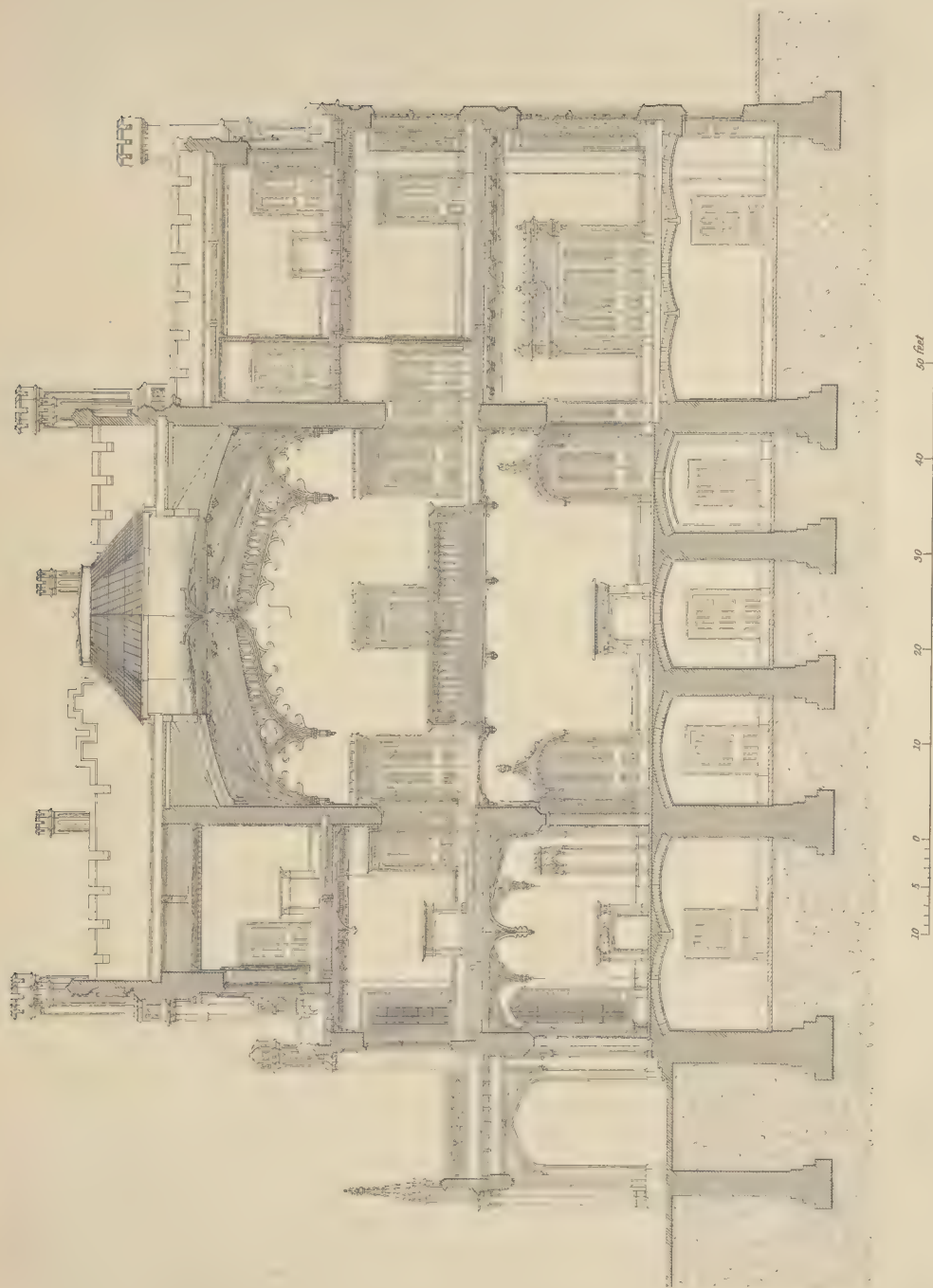
Drawn by J. White



BACK ELEVATION.

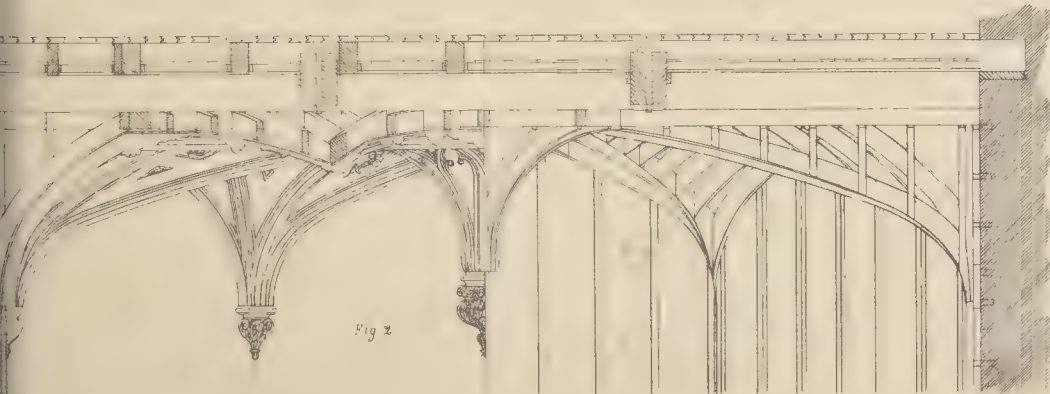
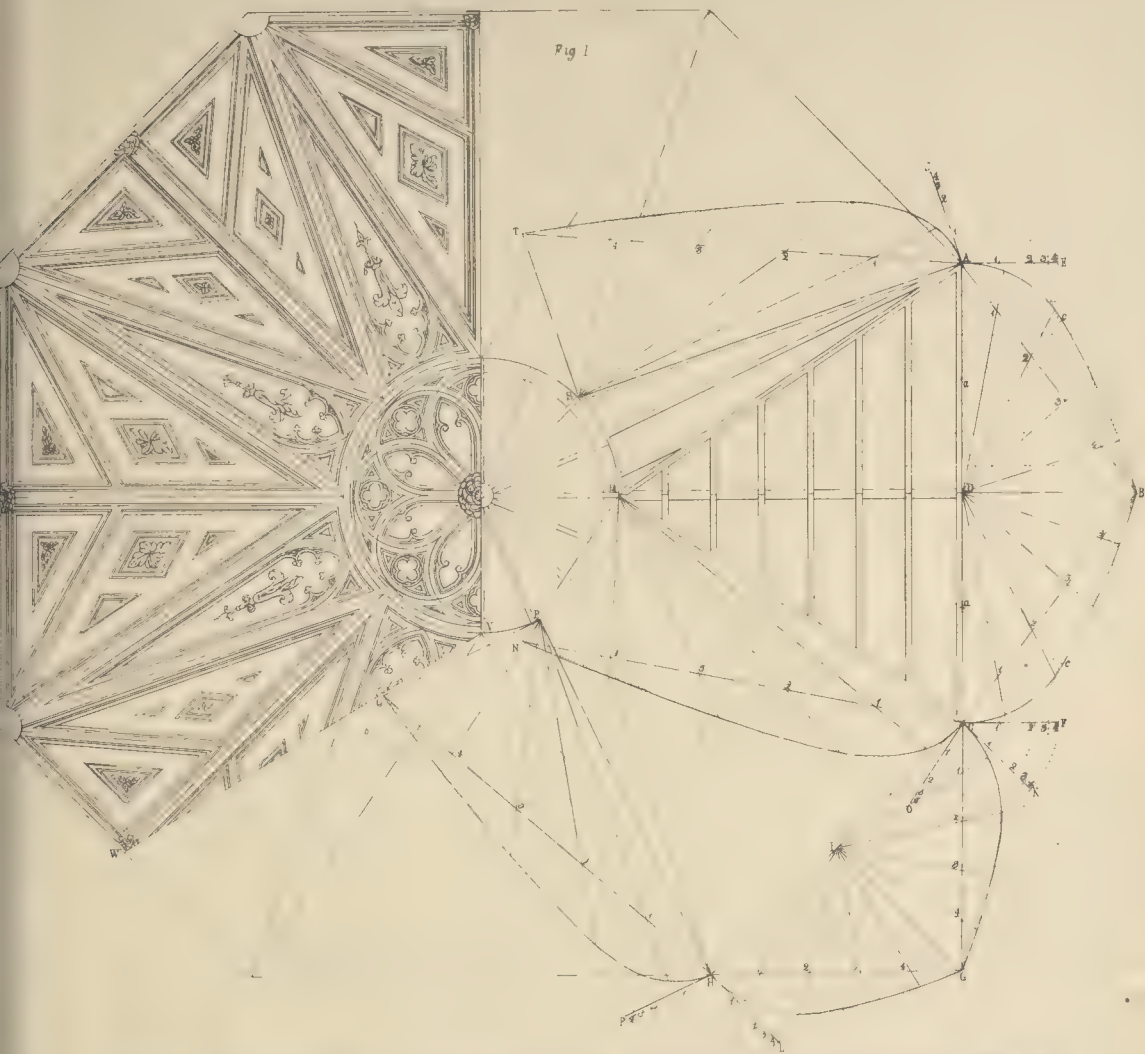


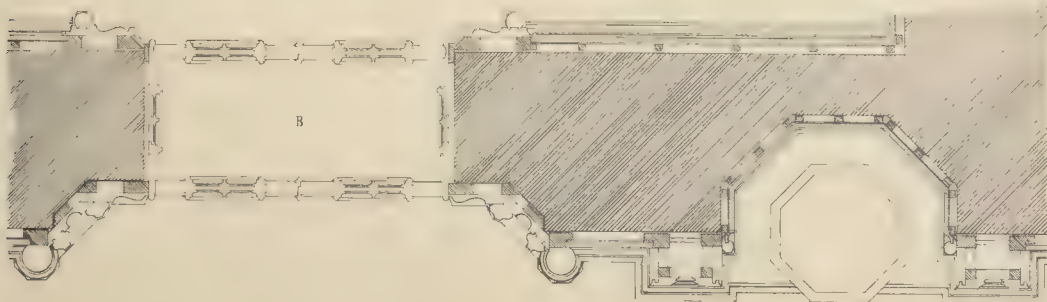
0 5 10 20 40 80 feet.



BLACKIE & SON, GLASGOW, EDIN., AND LONDON.

W. A. BAKER, SC.





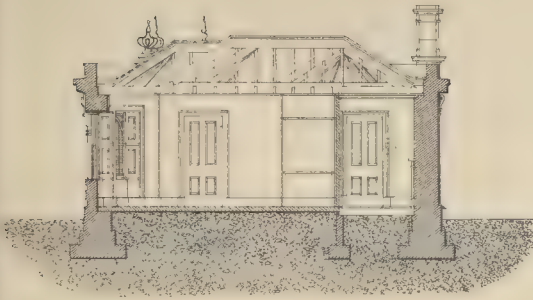


Fig. 7

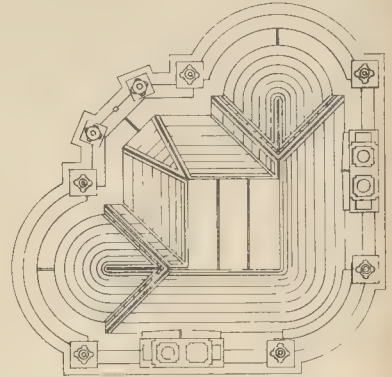


Fig. 8

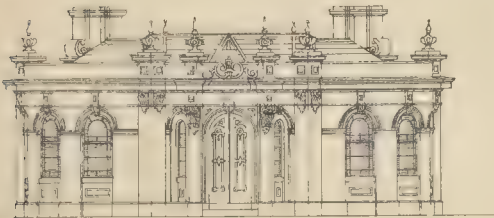


Fig. 5

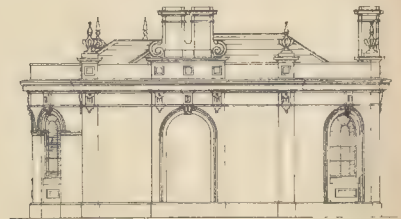


Fig. 6



Fig. 4



Fig. 2

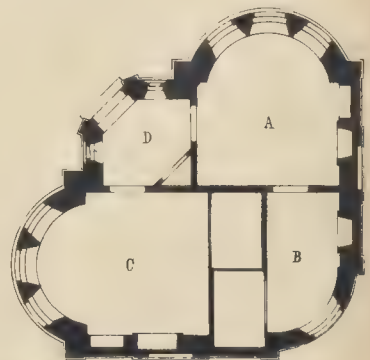


Fig. 3

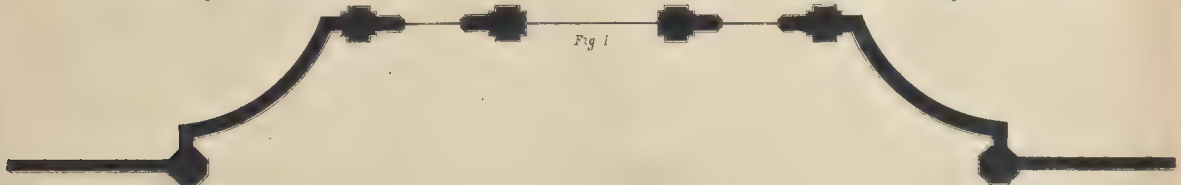
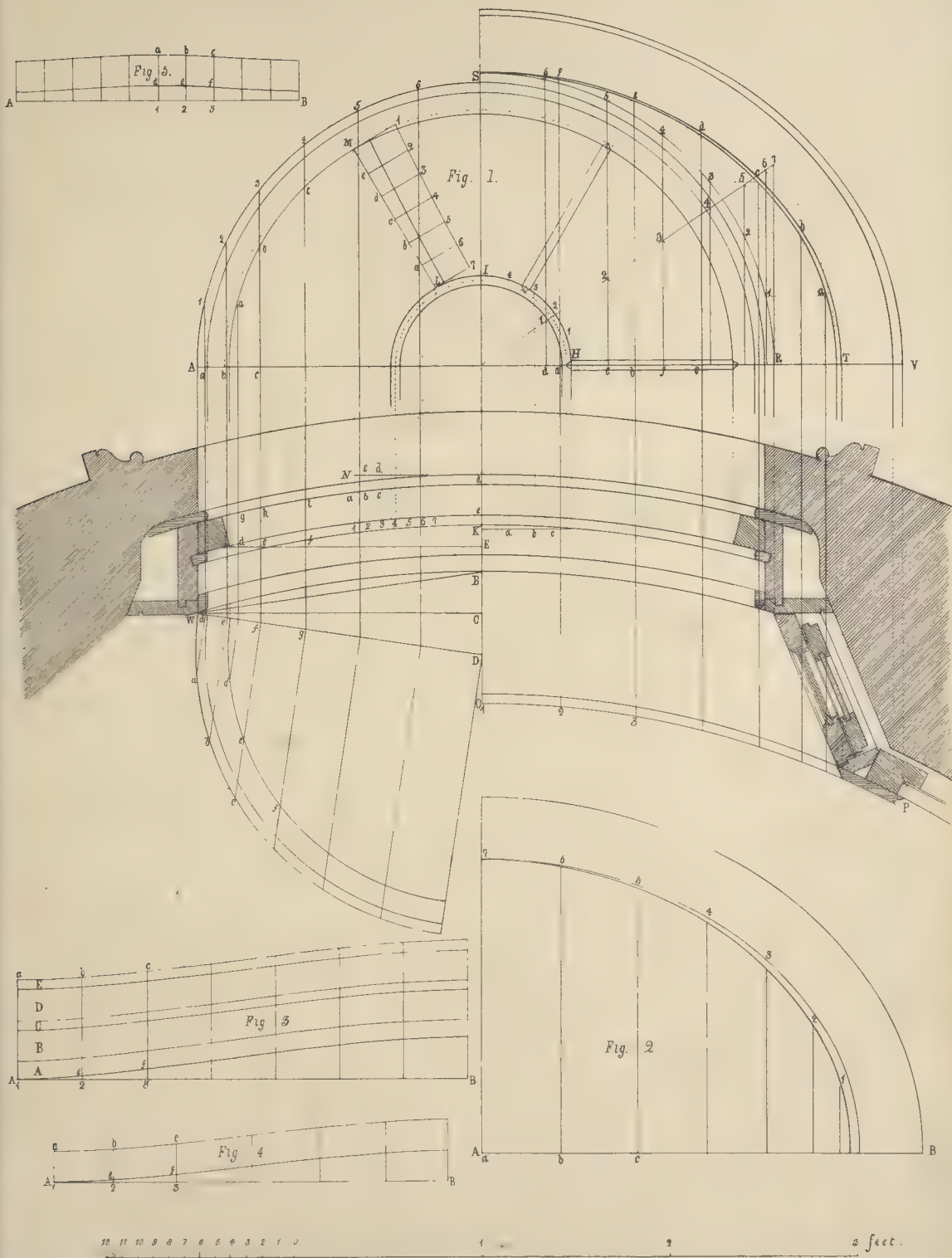


Fig. 1

0 5 10 20 30 40 50 feet

DETAILS.

PLATE LXII



DETAILS.

PLATE LXX.

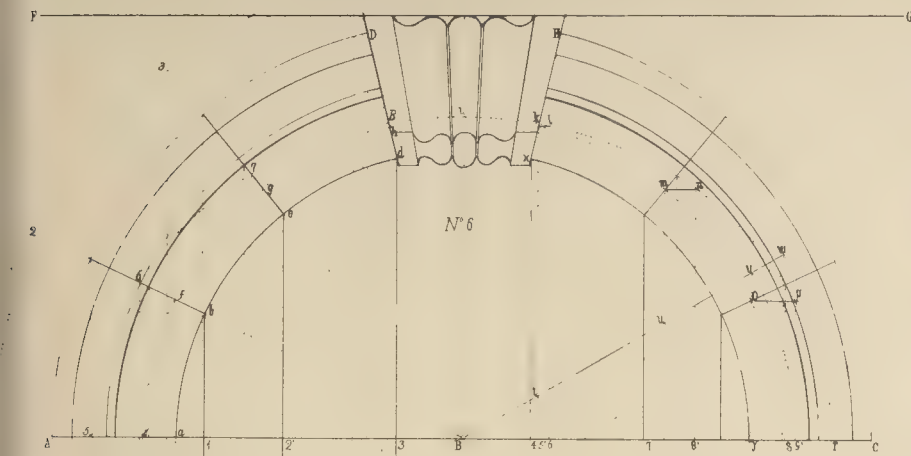


Fig. 1

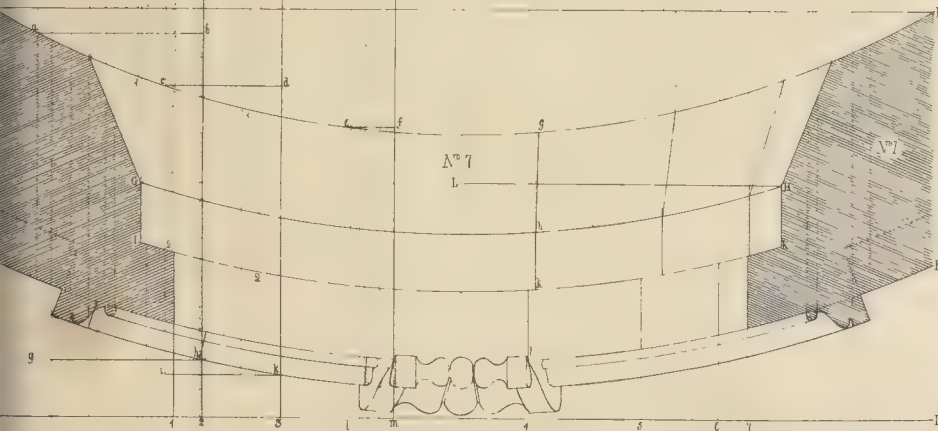
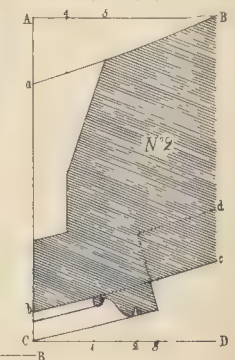
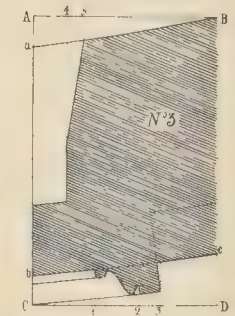
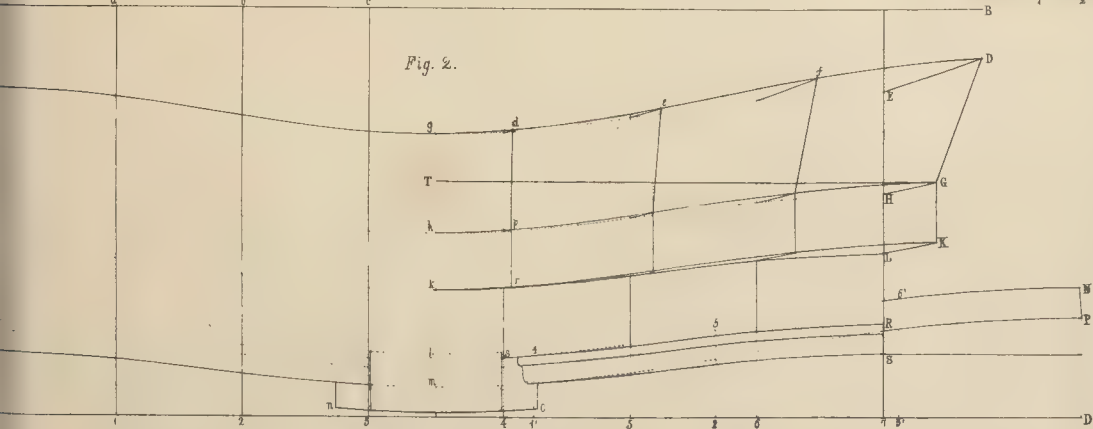
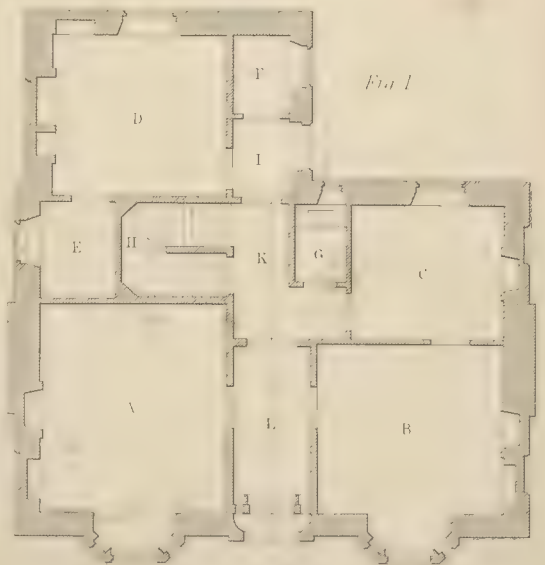
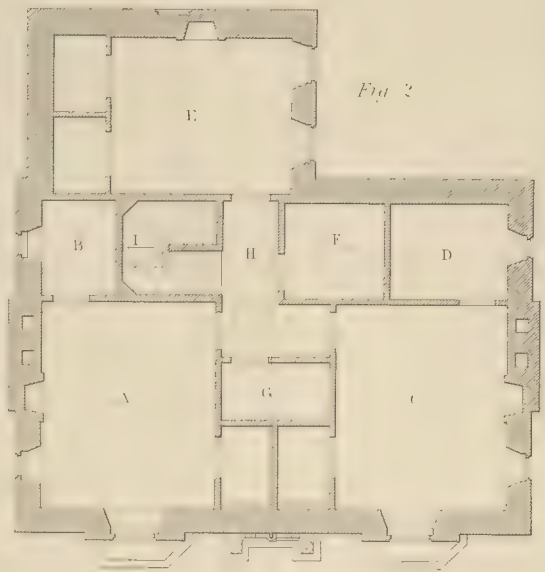
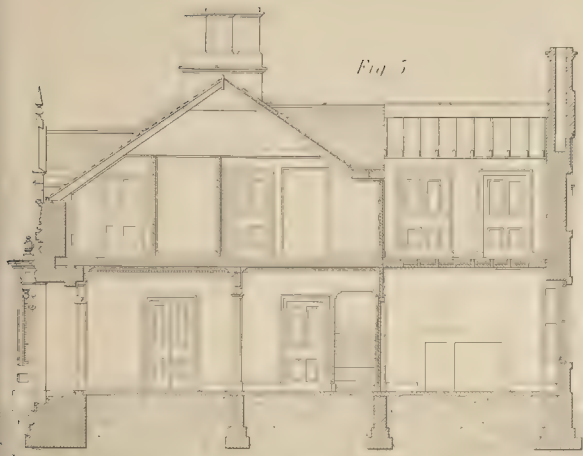


Fig. 2.





10 0 10 10 feet

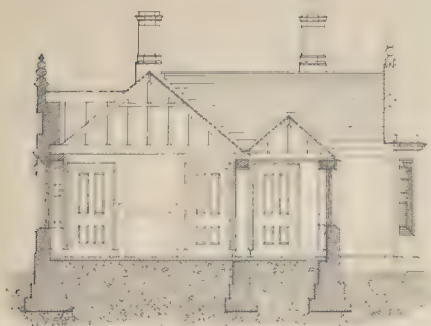


Fig 1

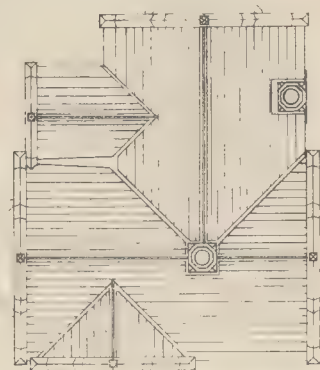


Fig 8



Fig 5

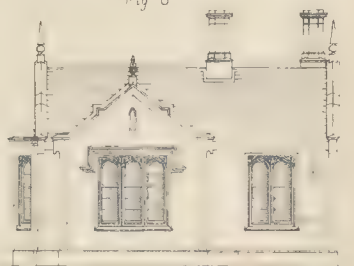


Fig 6

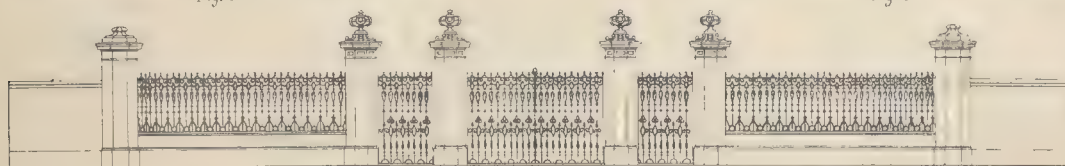


Fig 4



Fig 2



Fig 3

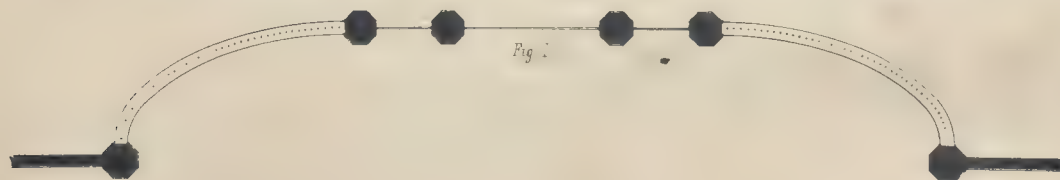
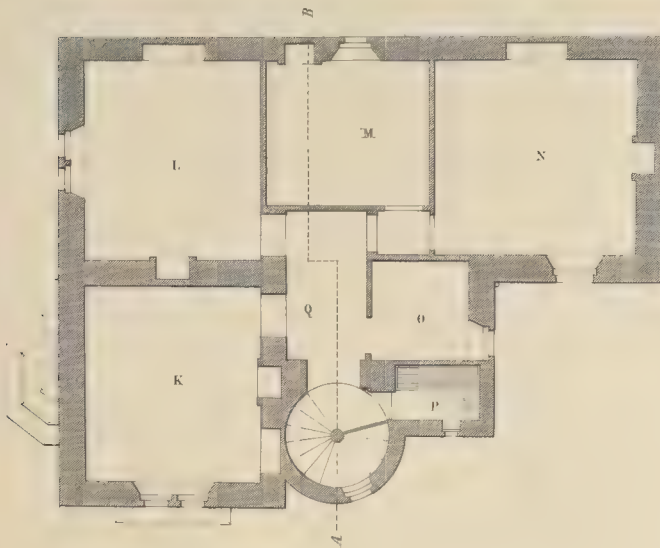


Fig 7

0 20 40 60 feet

VILLA. OLD SCOTCH STYLE.

PLATE. LXVI



Plan of Chamber Floor.



Plan of Ground Floor.

10 0 10 20 30 40 50 feet



Flank Elevation.

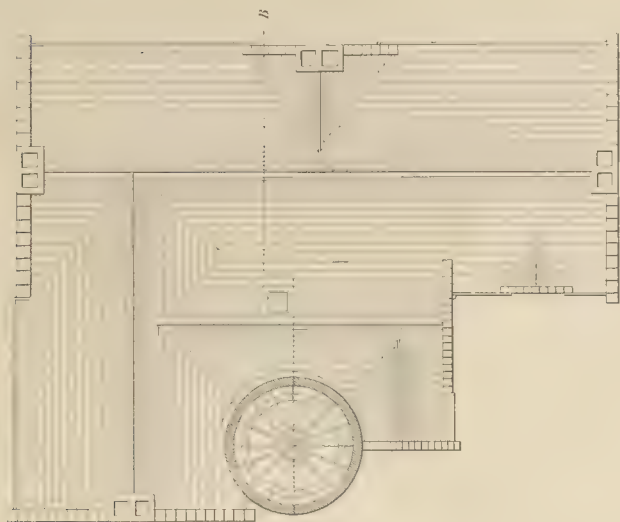


Front Elevation.

10 5 0 10 20 30 40 50 feet

VILLA, OLD SCOTCH STYLE.

PLATE LVIII



Plan of Roof.



*Transverse Section
on the line A. B.*

30 5 0 10 20 30 40 50 feet

ROOFS.

PLATE LXX.

Fig 1

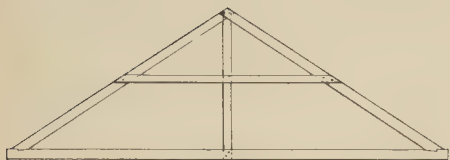


Fig 2.

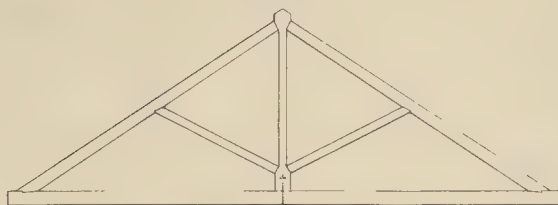


Fig. 3.

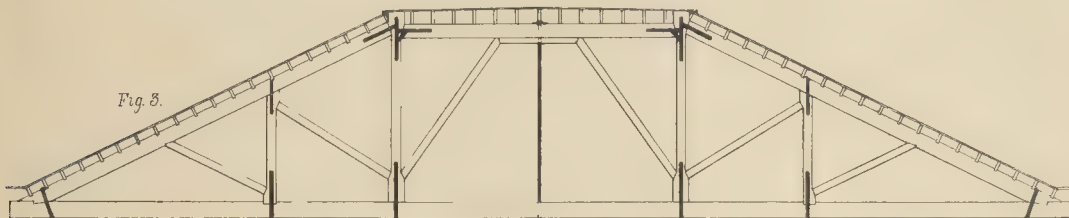


Fig. 4.

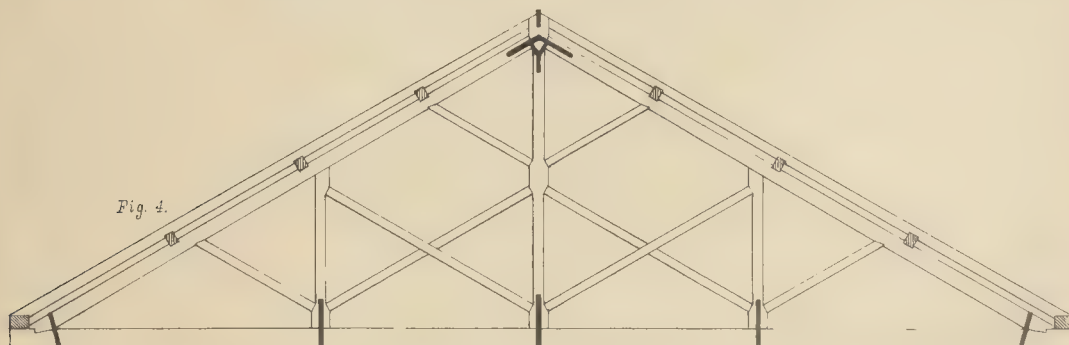


Fig 5.

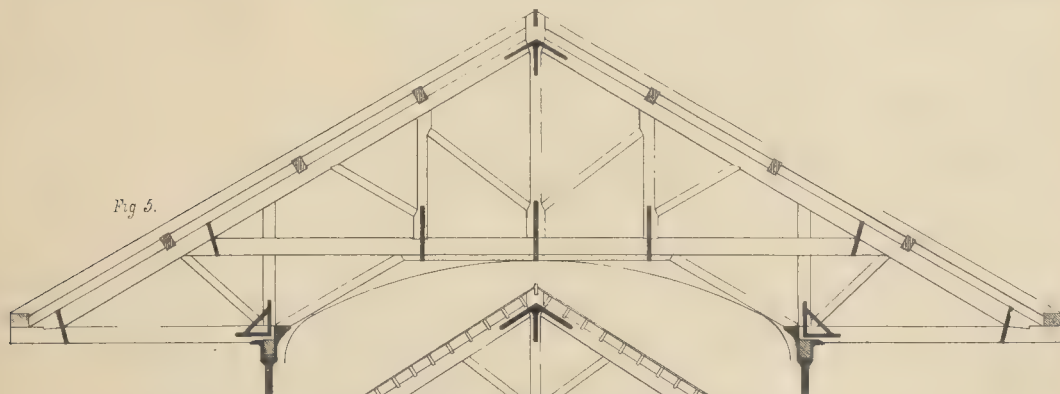
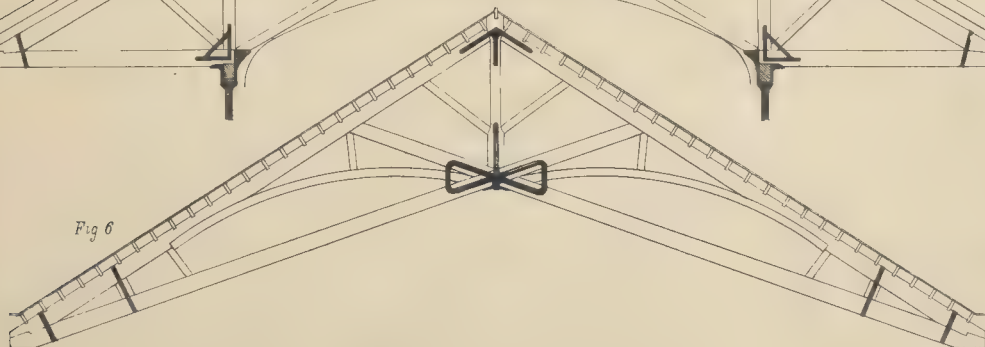


Fig 6



10 5 0 10 20 30 40 50 feet

Drawn by J. White

D O M E S .

PLATE LXXI.

Fig 1

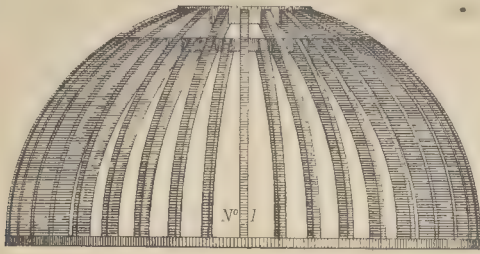
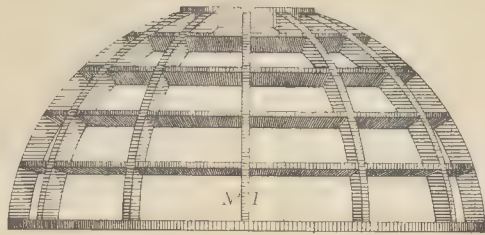
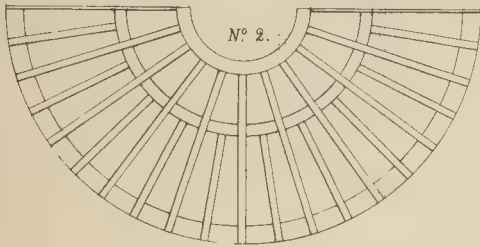


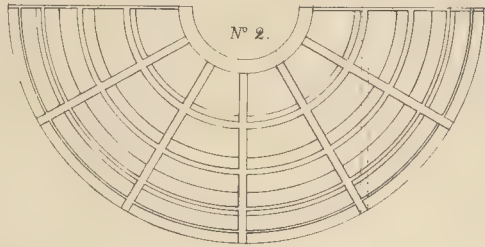
Fig 2.



N° 2.



N° 2.



N° 3.

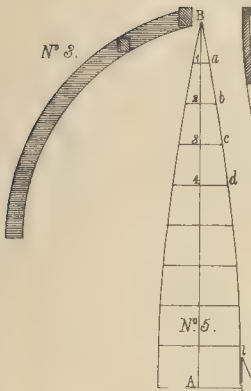


Fig. 3. N° 1.

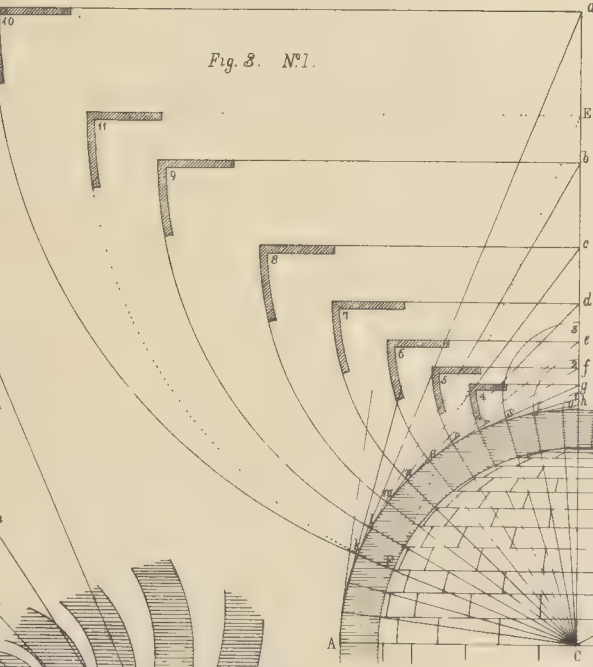
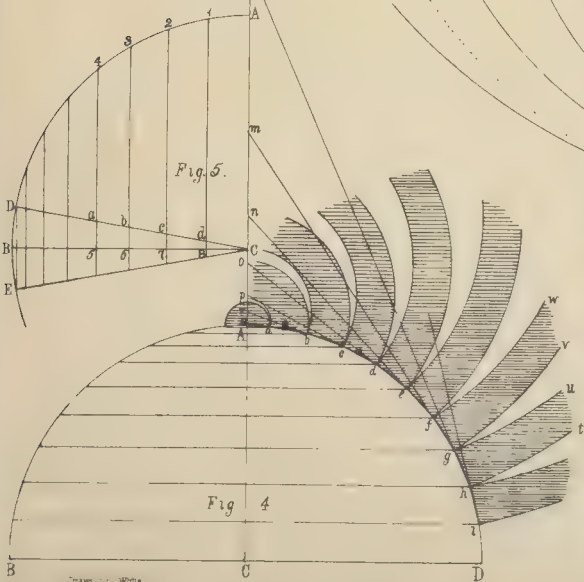
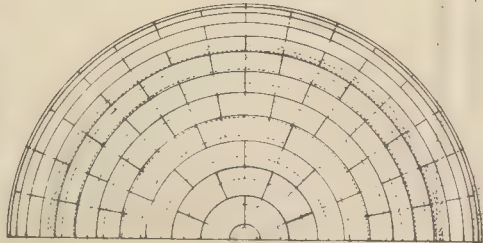


Fig. 5.

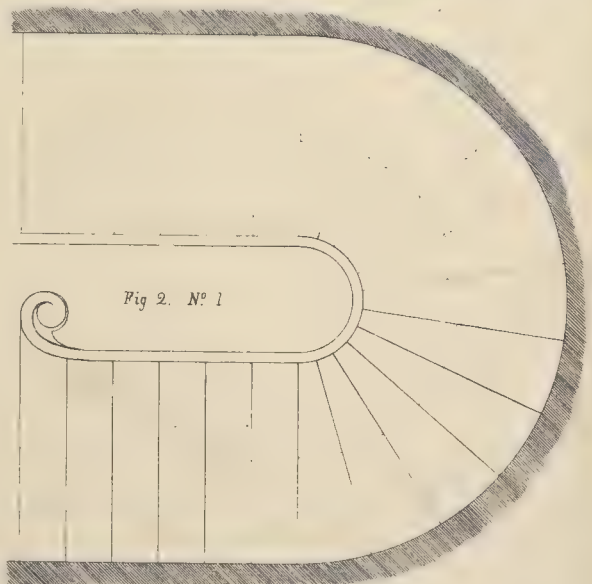
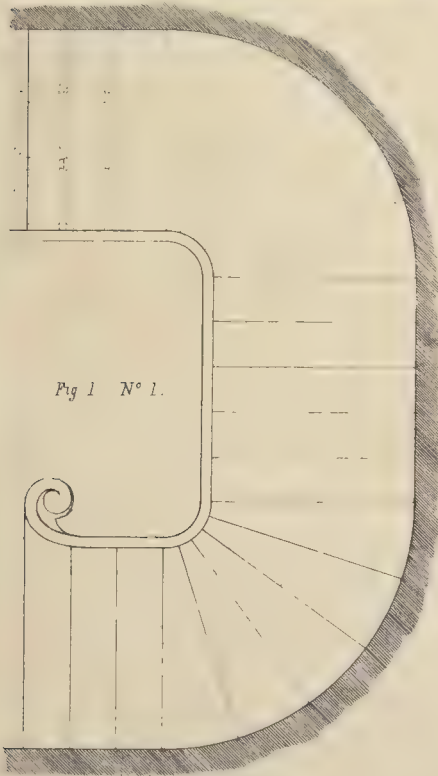
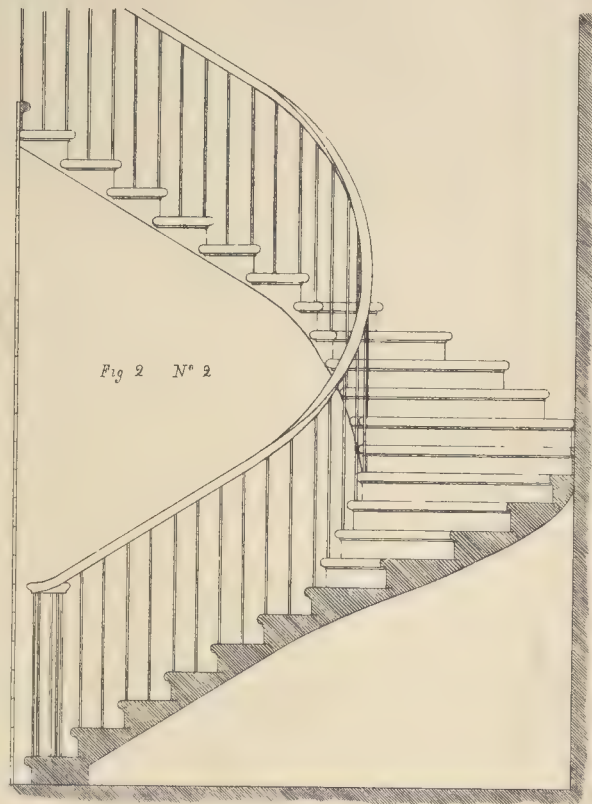
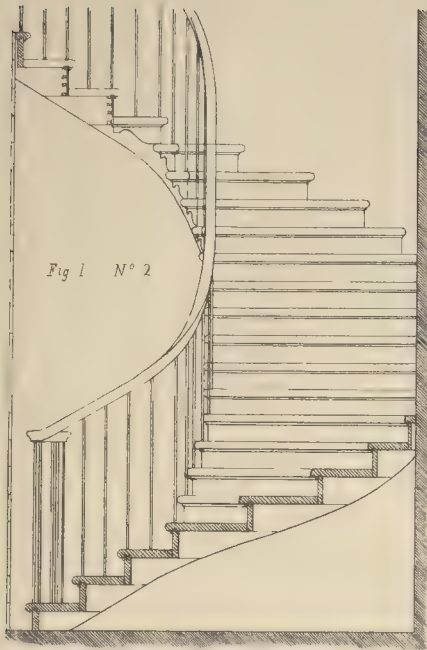


N° 2.



STAIRS

PLATE LXXIII.

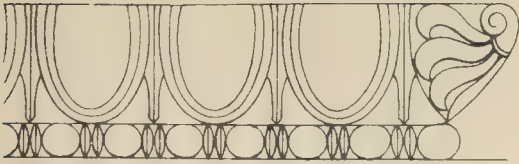


0 1 2 3 4 5 6 7 8 9 feet

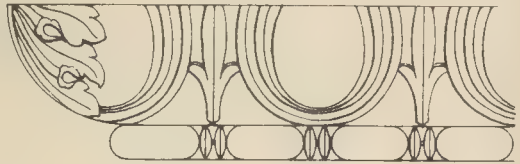
MOULDINGS.

PLATE LXXIV.

A



B



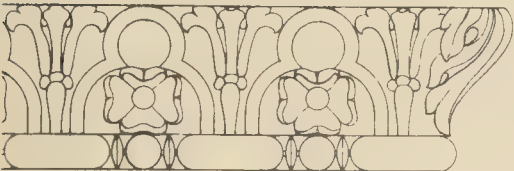
C



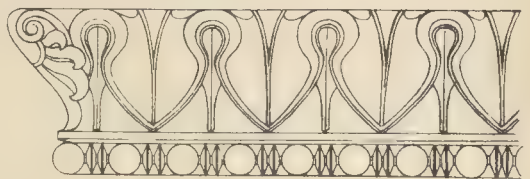
D



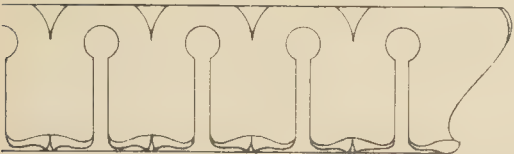
E



F



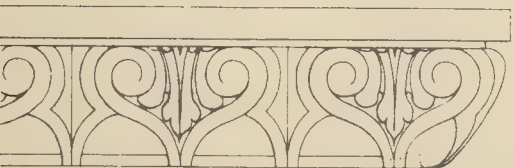
G



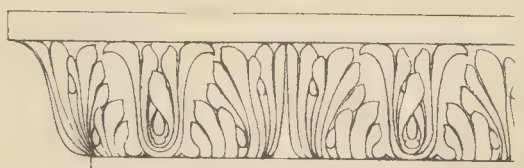
H



I



K



L



F R I E Z E S

PLATE LXXV.

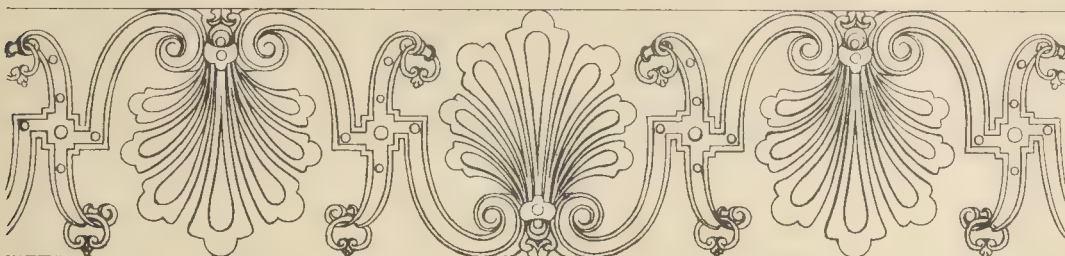
A



A



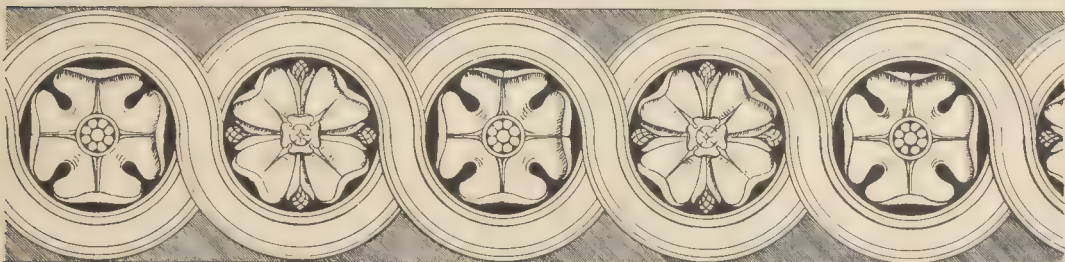
B



C



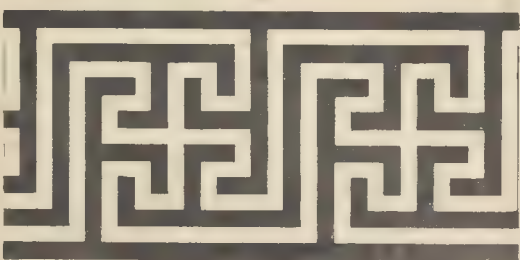
D



E



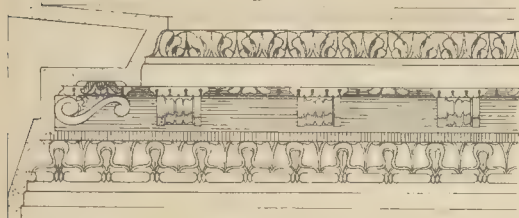
E



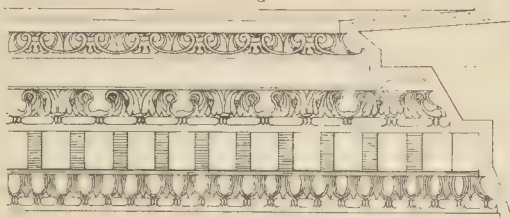
A



B



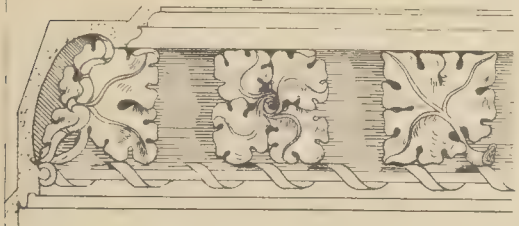
C



D



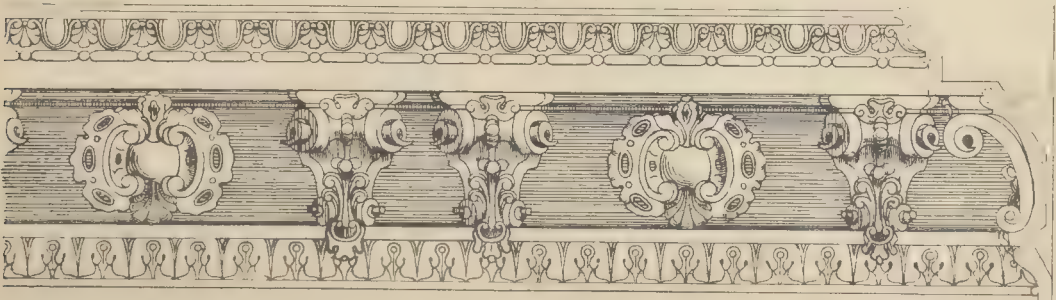
E



F



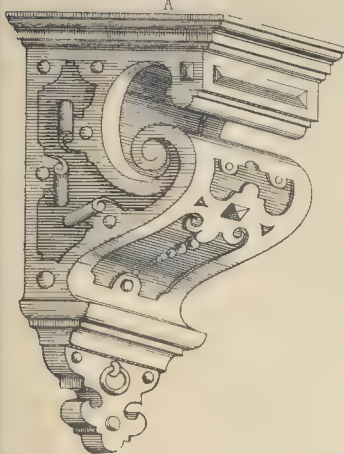
G



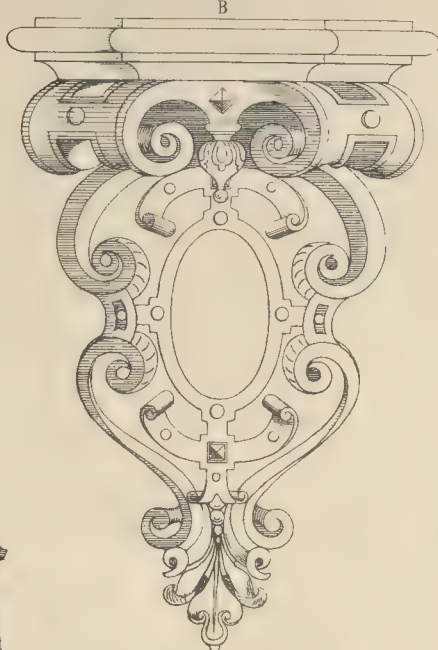
BRACKETS.

PLATE LXXVII

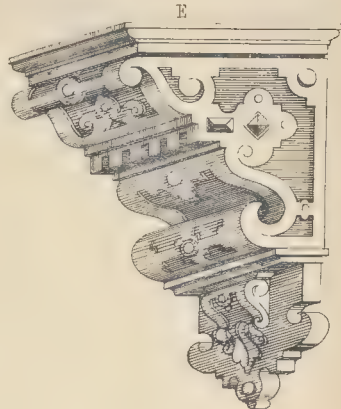
A



B



E



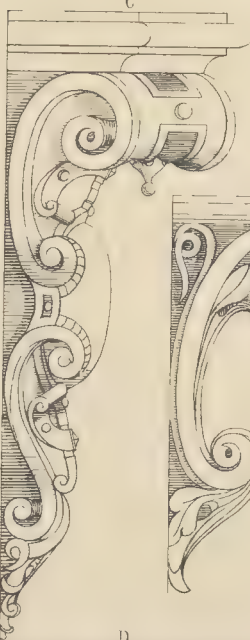
F



G



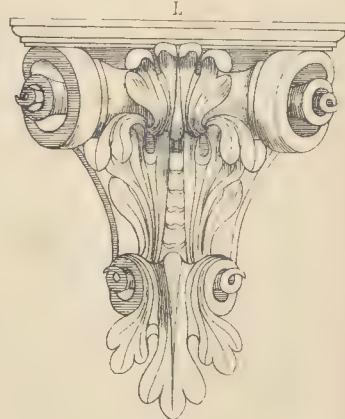
C



M



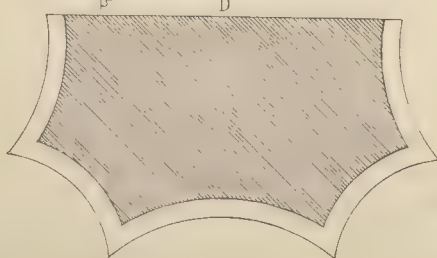
L



K



D



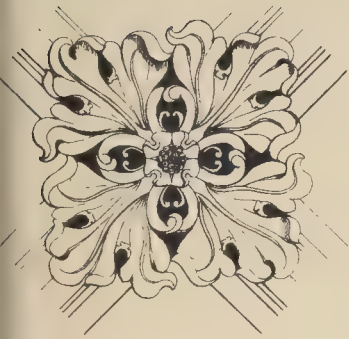
H



BOSSES.

PLATE LXVIII

A



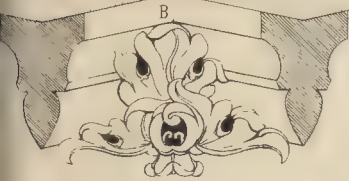
C



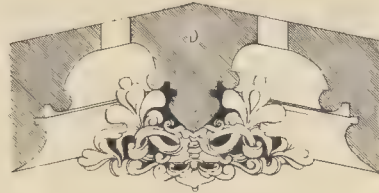
E



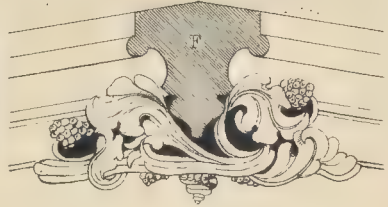
B



D



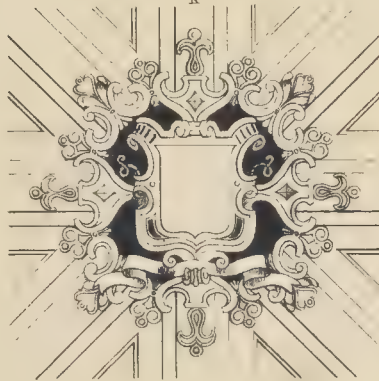
F



G



K



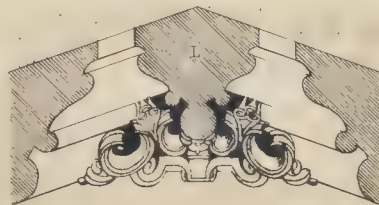
M



H



I

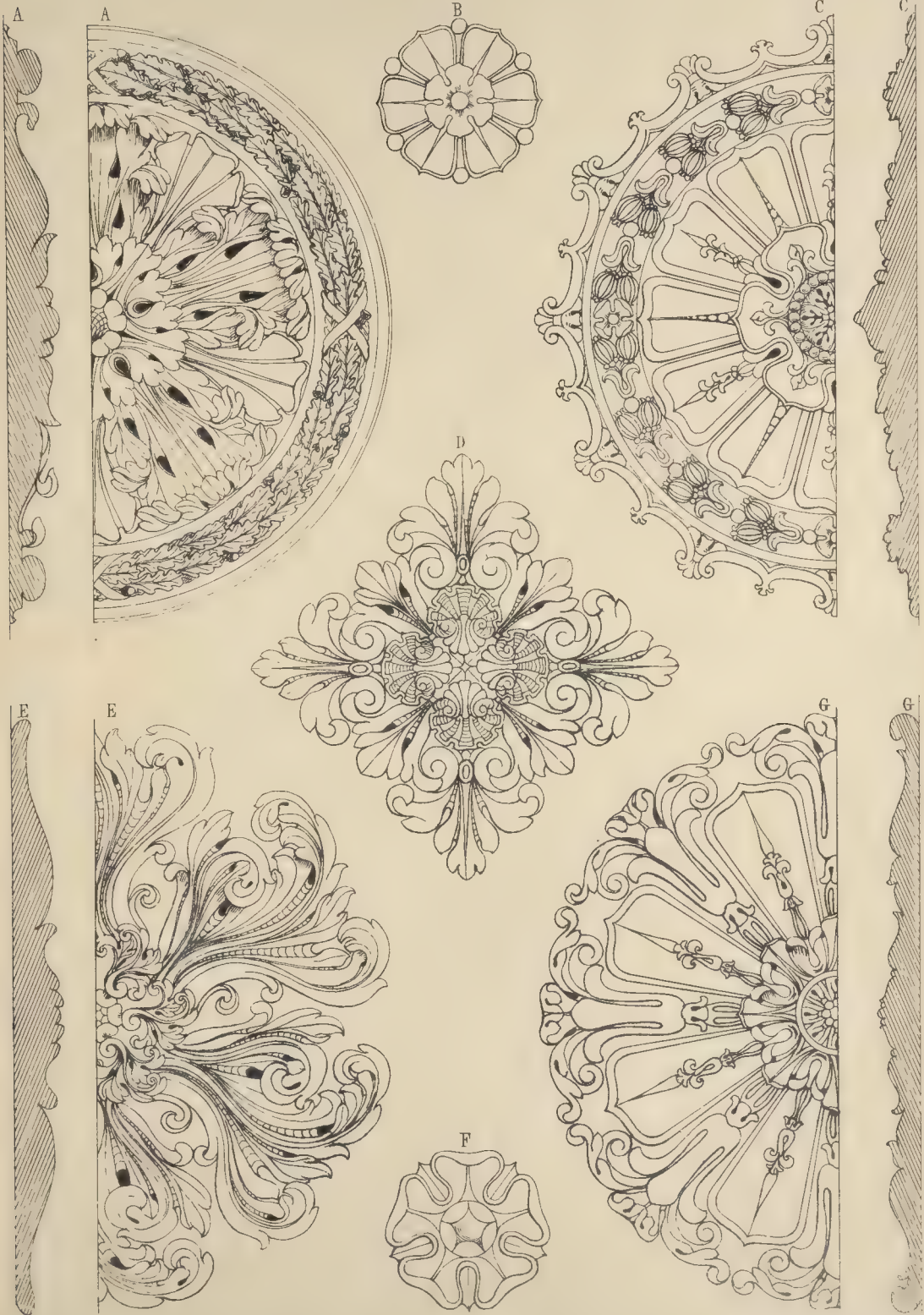


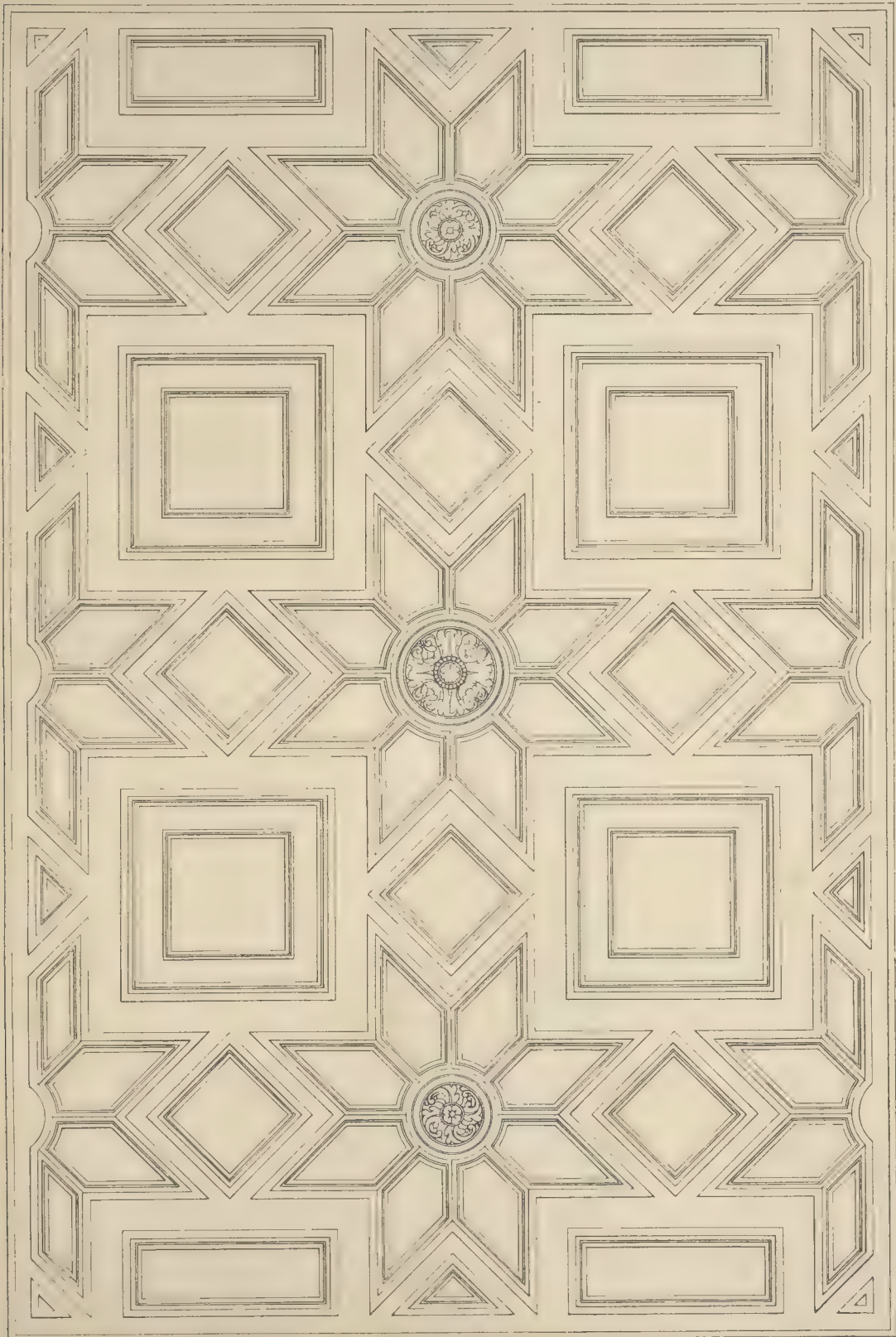
L



BOSSSES.

PLATE LXXIX.



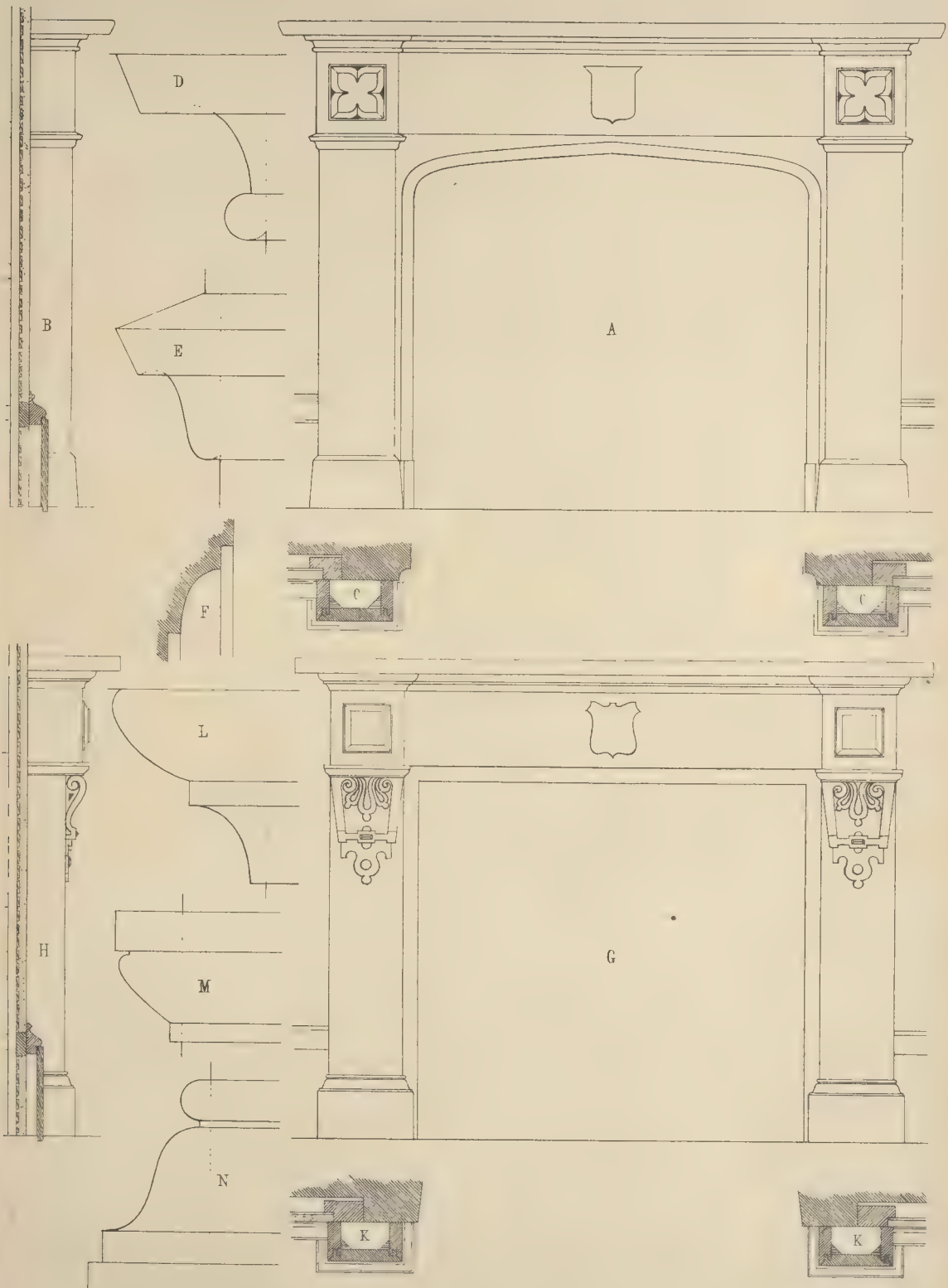


PLAN OF CEILING.

PLATE LXXXI.

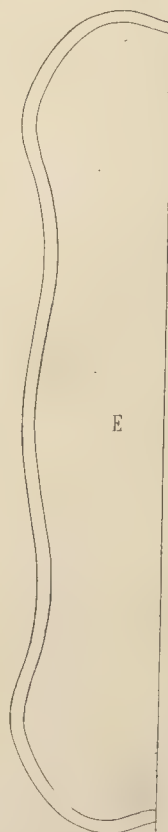
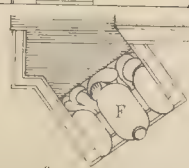
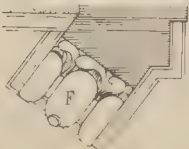
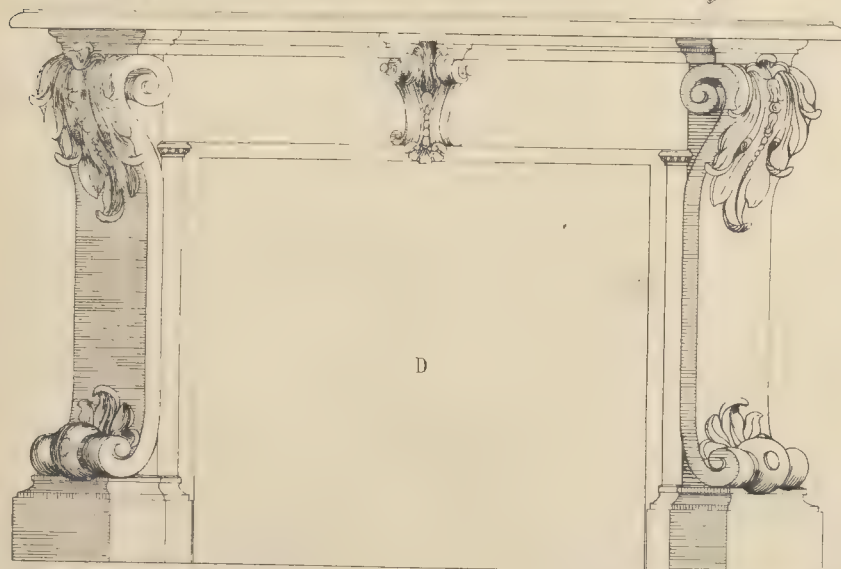
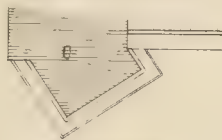
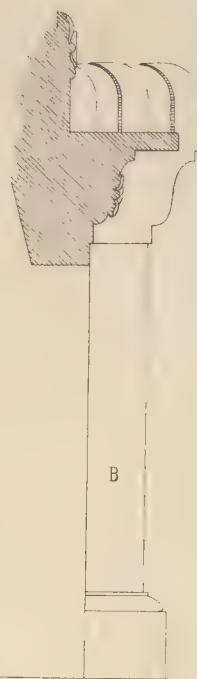
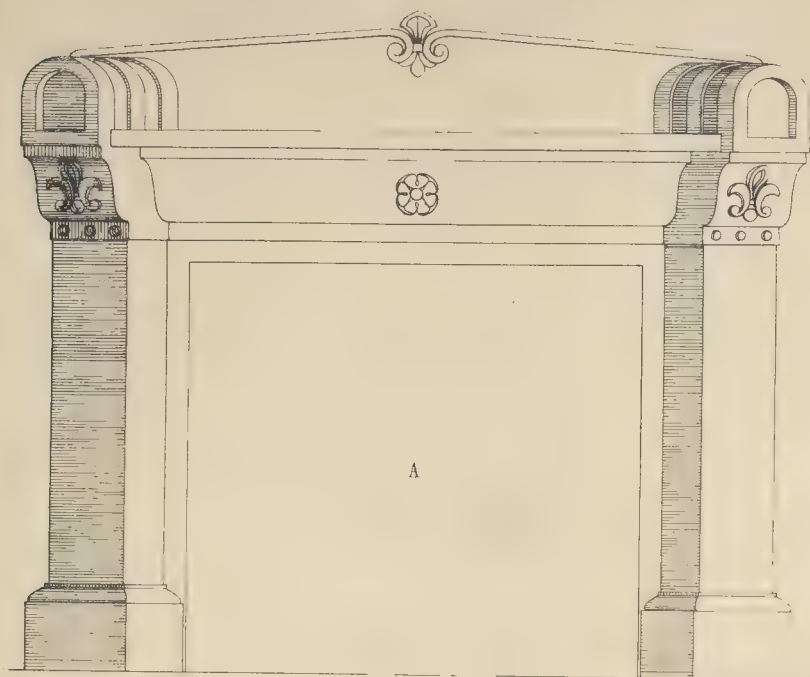


12 9 6 3 0 1 2 3 4 5 6 7 8 9 0 11 feet.



CHIMNEY PIECES

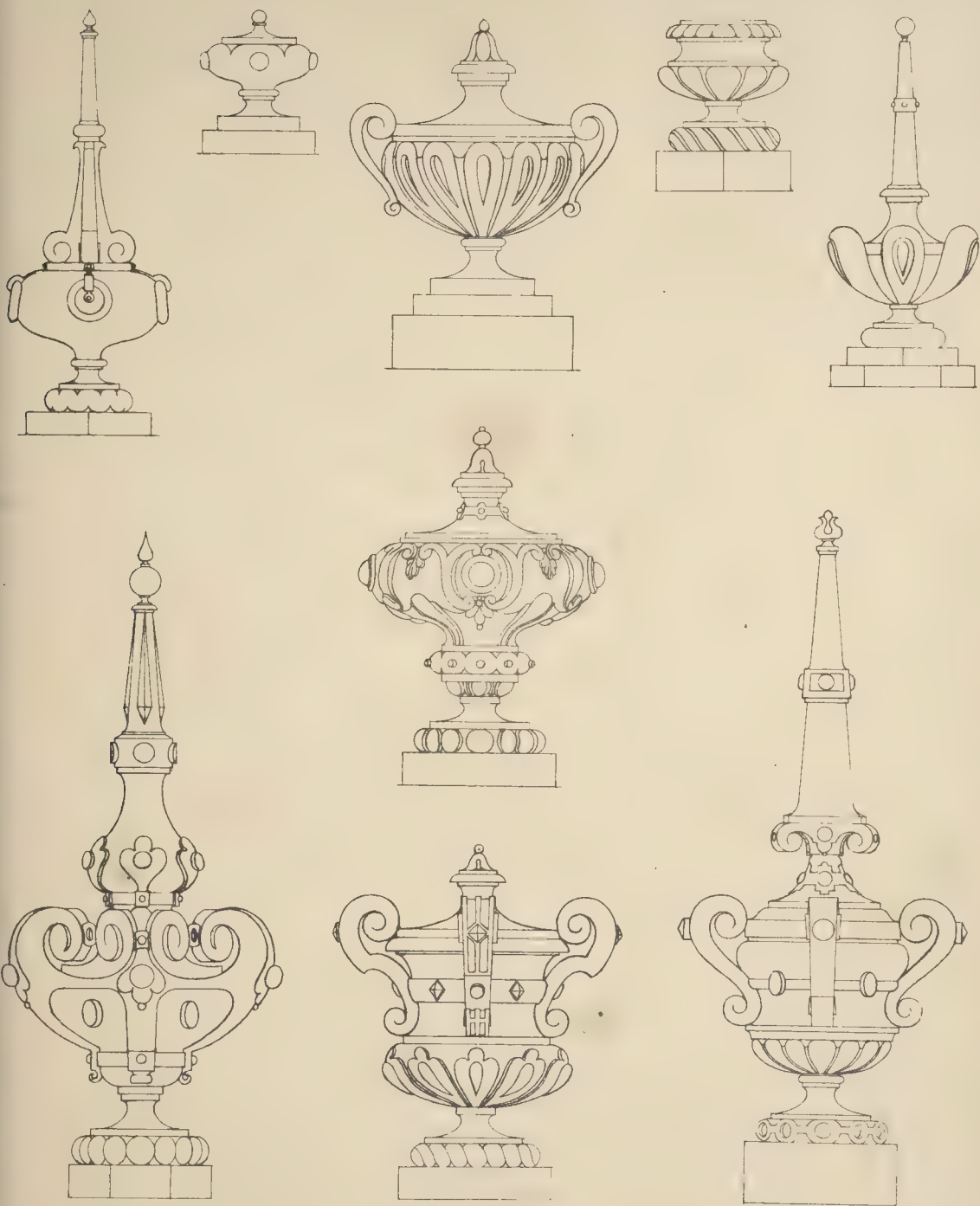
PLATE LXXVIII.

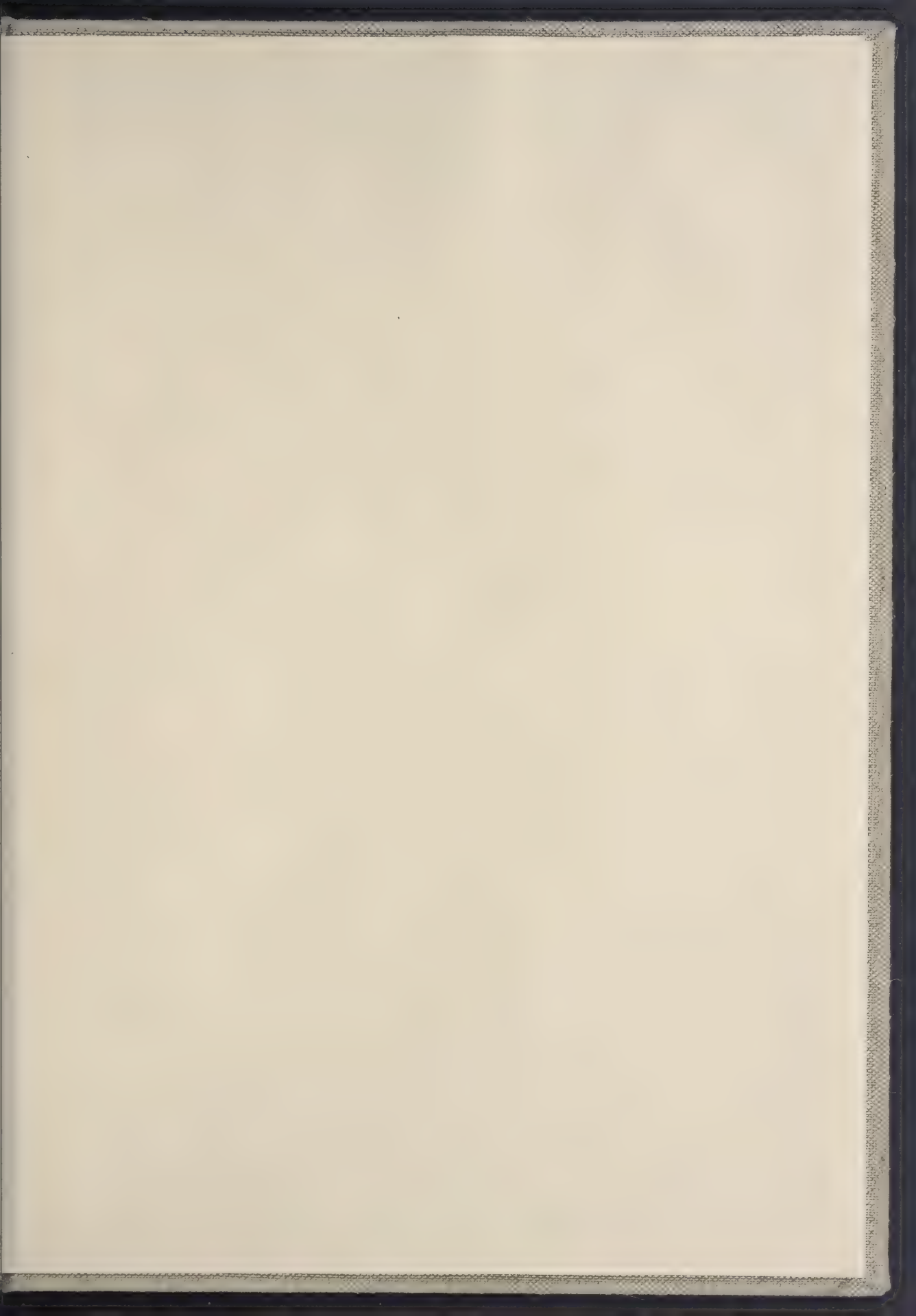


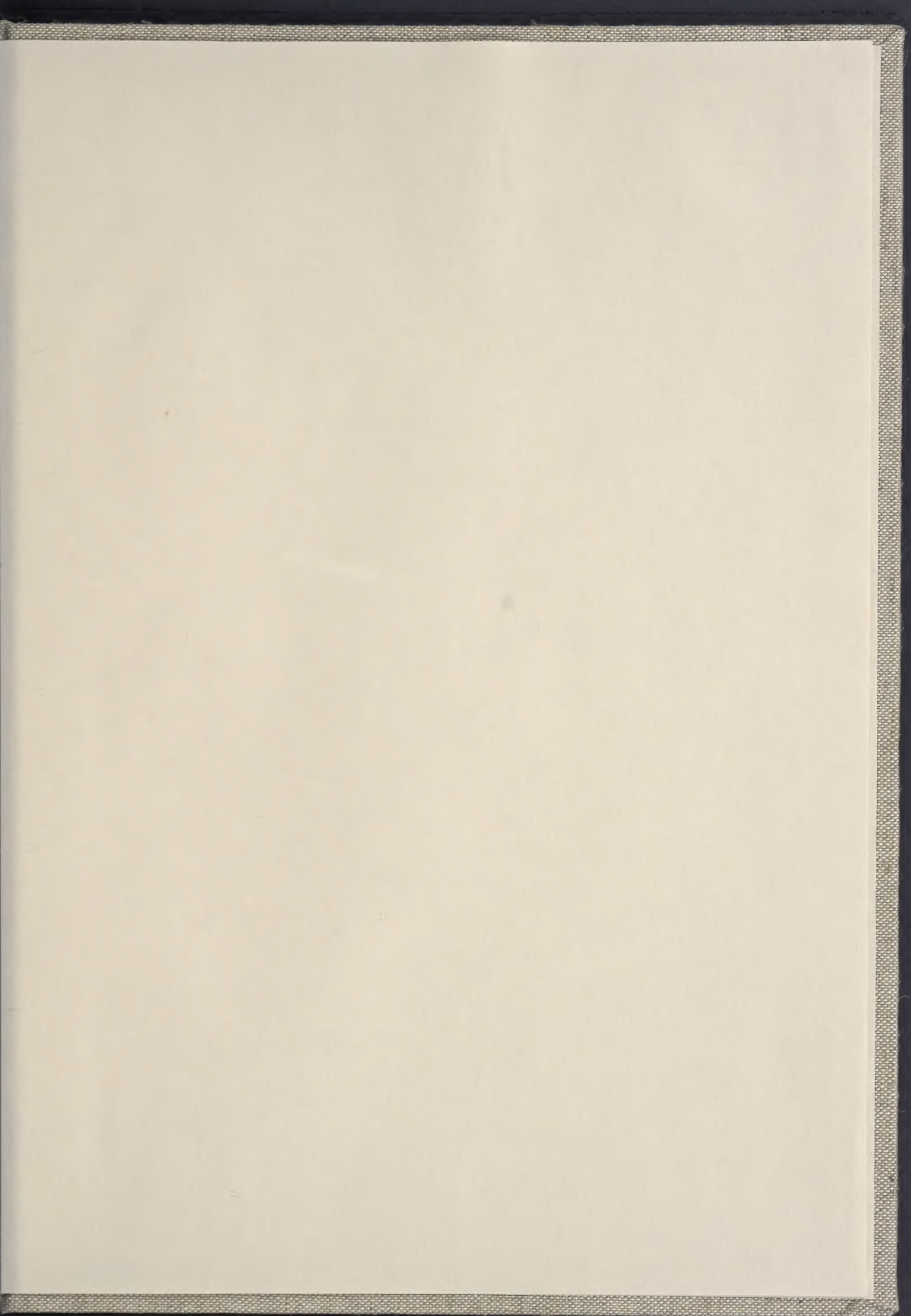
5 feet.

VASES.

PLATE LXXXIV.









Special
folio 91-B
29380

